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The New Trade Agreement

HIGH hopes will properly be built upon the Anglo-American Trade Agreement. It would not have been possible without the Munich Political Agreement, and the world should accept them as complementary parts of the same policy. What the British Government are aiming at, with the undoubted support of the majority of the nation, is the preservation of peace in Europe with, as its necessary corollary, the extension of goodwill to the field of international trade. Great Britain recognises no inevitable enemies and wishes, at the same time, to do more trade with its friends. The United States is far and away Great Britain's biggest customer among foreign countries. Its people speak the same language, and its institutions are cast in a similar mould to ours. Every psychological as well as political consideration demands a closer and more fruitful collaboration between the two nations. The trade agreement has such manifest advantages as to make it a possible turning point in the history of the two leading exponents of the democratic system. At a moment when certain continental nations are withdrawing ever closer within their economic frontiers, and when the problem of the Pacific is appalling thoughtful men by the immensity of its dangers, Mr. Chamberlain and President Roosevelt have decreed that there shall be no problem of the Atlantic. Trade across that ocean may not be as free as many would like it to be, but that is not Great Britain's fault, and there will in future be fewer barriers to the international exchange of commodities than in any corresponding area on the face of the globe.

The trade agreement follows quickly on the announcement that King George has accepted a cordial invitation to visit the United States next summer. Both are symptoms of an entirely new spirit. No British sovereign has ever set foot on American soil, and a trade agreement between the two countries on the present comprehensive scale would have seemed impossible in any other age. The two Governments are giving a fine lead, first to their own peoples, but by implication to the whole world. It is inconceivable that they should ever again engage in fratricidal strife on the field of battle. They are sealing that unwritten covenant by determining to work together in the field of industry and commerce for the greater prosperity of both.

One of the chief troubles of the world in the last ten years has been that it has been poor and that its poverty has been largely attributable to its own blunders. It can never be even comfortably off until it recognises that trade is international and that the prosperity of one people is the best hope for the rest. The Anglo-American agreement is based on this principle. It is a symbol to the whole world of a return to a saner statesmanship by the first serious reversal of the engines of economic nationalism which have been the curse of the business community ever since men began to think more of their race than of their fellowship.

As to the terms in which the agreement itself is couched, they are surprisingly simple and straightforward. But it is a simplicity which can only have resulted from the closest and most painstaking deliberation of two parties with the same ultimate object in view, for the expression of a workable and fairly balanced agreement between two such large trading countries demands the utmost clarity and brevity unless the scheme be lost in a morass of inoperable cross-referenced schedules. In brief, by the terms of the agreement, the United States has granted concessions applying to about two-thirds of the goods imported from this country (total imports from Great Britain amounted to £40 millions in 1936) and these concessions represent substantial reductions in duty, by 40 per cent. or more in some cases. This country has made similar concessions in return; the agreement is mutually fair to the negotiators. Just as valuable a feature is the provision of machinery for amending the agreement in two distinct sets of special circumstances; first, if it is found at any time that a third country is benefiting most from any particular tariff reduction; and second, if there should be a wide variation in the pound-dollar rate of exchange. This provision of special amendment caters for two contingencies which might well have proved stumbling-blocks for the future and gives just the right degree of elasticity which makes for permanence.

The concessions are spread over a wide range of goods. It is inevitable that some industries will benefit while others will be called upon to make some sacrifices; this is part and parcel of any trade pact. Although it is too early to determine to what extent our chemical industry will be affected, it would appear from a study of the agreement that it should at any rate be affected favourably. As will be seen from the lists of chemical products with the new import and export rates of duty, published on pages 413 and 414, the concessions made by the United States on chemical imports from Great Britain not only exceed those made by this country on imports from America in number, but also in importance. But it should be remembered that Canada, in common with other Dominions and India, has consented to modifications of her rights under existing agreements with the United Kingdom to facilitate our agreement with the United States. We have compensated Canada for this by modifying our rights to certain preferences in Canada under the 1937 Trade Agreement. We have agreed to reductions in our guaranteed preferences for chemicals and drugs.

India's Big Industrial Alcohol Project

FOR the leading European countries there are certain common reasons in favour of the establishment of an industrial alcohol industry: the quantities of imported petrol would be substantially decreased, a substitute for petrol in times of emergency would be provided, and the industry would be instrumental in the development of other industries. In the case of India, all these reasons hold good, but there is the additional very cogent factor that a suitable raw material for industrial alcohol manufacture is available in abundant quantities and at a low cost. The protective tariff on sugar in India built up a sugar industry which now satisfies practically all India's requirements. But at the same time there was created an increasing surplus of molasses, so that this material which commanded a value of about 3s. a cwt. a few years ago is to-day only worth 2d. or 3d. a cwt., and in some cases is simply a valueless waste. The total Indian production of molasses in the year 1936/1937 was about 550,000 tons, of which about 90 per cent. was produced by factories in the U.P. and Bihar; 350,000 tons were surplus.

It is now generally recognised that the addition of alcohol to petrol (the best proportion is about 25 per cent.) has beneficial effects, and laws compelling the mixing of alcohol with petrol are in force in a number of European countries, notably France, Germany and Italy. If economic considerations allow these countries to introduce these mixing laws, then it is clear that for India with her surplus molasses to dispose of and ability to produce alcohol at an extremely low cost, it would be an even more feasible proposition. It is estimated that this would replace a total of 35 million gallons of imported petrol. Alcohol could also partially replace kerosene used for lighting and as a fuel. Kerosene imports into India reach the figure of 182 million gallons annually, and it is estimated that of these, 22 million gallons could be replaced by the fifth year of development of the alcohol industry.

It is understood that an alcohol-petrol mixture may soon be the motor spirit of India, and a scheme is proposed to set up six huge distilleries, each having a daily output of 30,000 gallons of alcohol. The proposed scheme would be developed in stages, bringing the total annual production of the six central distilleries to 60 million gallons of power alcohol by the end of the fifth year, replacing 38 million gallons of imported petrol and 22 million gallons imported kerosene. Yeast fermentation of molasses yields an ethyl alcohol of 95 per cent. strength, the best conditions being produced by using molasses diluted to 15-20° Brix and fermenting at an acidity of about *p*H 5.

It is, of course, essential to have a water-free alcohol for mixing with petrol, and it is proposed to dehydrate the 95 per cent. alcohol by an azeotropic process, using benzole as the auxiliary liquid for the ternary mixture. It is estimated that the consumption of benzole would be about 0.004 gallon per gallon of absolute alcohol produced, and this would lead to the further establishment of benzole recovery plants at coking centres. Benzole could also be used for denaturing or else wood naphtha from wood distillation plants could also be made available in India at low cost. The fermentation alcohol could also be utilised for the production of commercial solvents, and the distillery by-products would yield such products as fertilisers, yeast, and dry ice.

On the first proposed central distillery unit, at Sonepore, it is calculated that power alcohol manufactured by the azeotropic process would cost Rs. -/4/3 per gallon, and it could be delivered to any mixing depot in India at an average price of Rs. 1/1/6, the average retail price of the mixed fuel being Rs. 1/4/-, against Rs.1/7/- for petrol, averaged over the past three years. In addition to this benefit, the proposed scheme would also afford substantial relief to the sugar industry and help to stabilise petrol prices throughout the country.

It is interesting to note that owing to the low price obtainable for molasses, a number of Indian distillers turned, a short time ago, to the manufacture of industrial alcohol, which had previously been imported from Java, and orders for seven or eight large stills were obtained by French and German manufacturers. So far as is known, no orders were received by British firms because the foreign firms, scenting trade, sent their representatives out to India and they got the business. If this is a true representation of the facts, it is a sorry story; especially in these days when export trade is probably more difficult than ever before. But if the present scheme goes through to completion, there is the chance for British plant manufacturers of business with an Empire country and consequently of favourable trading conditions.

I.B. Fire Control

SETTING fire to buildings by the dropping of incendiary bombs from aircraft is now considered to be one of the most likely forms of air attack to be adopted widely in any future hostilities. Experts believe, and it is a very reasonable supposition, that the bombs will not be large in size so that a very large number could be carried by the aircraft and fires initiated over a wide area. Preventing incendiary bomb fires from spreading is a very real problem, but one that must be faced if it is determined to make our defences against air-attack as invulnerable as possible. Tests have shown that incendiary bombs will penetrate the ordinary dwelling house roof and will come to rest on the floor of the upper room. They produce an intense heat, sometimes as much as 3,000° F., throwing out molten fragments to distances of several feet; but this effect is of comparatively short duration. In practice the bombs cannot be extinguished, but must be allowed to die down. All that can be done is to prevent as far as possible the floor of the upper room and the roof space from catching fire.

It is clear that what is required is a cheap composition which can easily be applied by the householder to the wood in the roof space to make it resistant to very high temperatures. Ordinary fire-resistant paints are worthless against the I.B. effects. Imperial Chemical Industries, Ltd., have now produced a product based on anhydrite, which appears to meet these requirements. It is cheap and sold in powder form, only requiring mixing with a little water for its application. From a film shown to the Press on Monday, of tests carried out with incendiary bombs discharged within wooden models of roof spaces coated with the new finish, it appears that the product is most effective in retarding and extinguishing this type of fire.

Chemicals in Fur Dyeing

By
"STONE-MARTEN"

THIS article will consider the chemicals used in the dyeing of certain types of fur, and will touch upon the troubles arising in the process; it is not intended to discuss the dressing of the raw pelts prior to dyeing. Regarding the dyeing process, there are three separate stages through which almost every kind of fur is generally taken, namely, killing, mordanting and dyeing.

Natural fur fibres all contain, to a greater or less degree, certain natural oily substances which render them water repellent and which therefore resist the dye solutions, preventing them from penetrating and becoming fixed in the fibres. To overcome this, the oily substances are removed by alkalies, the process being known as killing. Urine was originally used as the small proportion of ammonia formed proved fairly effective. The process was not capable of being controlled within fine limits, however, and as it is very easy to damage the fur by too strong a killing, and as there is such a divergence in the strength of alkali that different furs can stand, more efficient means were sought.

To-day, although most fur dyers have their own special formulæ, the basis of all is usually selected from slaked lime, soda ash, ammonia and, occasionally weak caustic soda, depending on the type of pelt that is to be killed. The method of application again depends on the type of fur that is under process. The two main methods of applying wet processes to furs are either by brushing the solution on to the fur or by immersing the entire skin in a vat of the liquid, or, of course, by a combination of the two methods. When killing by total immersion, this should be followed immediately by the mordanting and dyeing processes, as it is inadvisable to leave skins in a wet state for any length of time as the dressing in the leather quickly becomes affected and can give serious trouble. There is on the market a proprietary product, apparently from tests carried out, of casein origin that is really successful in protecting weak guard hairs from damage in the killing bath, yet which allows the killing action to take place in the normal way.

Application of Mordants

Although the fur can now be dyed satisfactorily if the killing process has been effectively carried out, the dyeings on some skins are insufficiently fast, and in any case fastness can invariably be improved by using a metallic mordant. These are obtained from the neutral salts of metals such as iron, copper, aluminium, chromium and tin.

The skins are treated, usually overnight, in an acid solution of the desired salt. Acidity is necessary to prevent the otherwise rapid precipitation of the salts, and to assist in their permanent fixation. The length of rinsing of the skins after mordanting and before dyeing is dependent on the type of mordant that has been used. The actual dyeing process varies according to the class of dyestuff used. Those dyestuffs used for textiles are not generally used, partly on account of their fastness properties and partly due to the brightness of the shades produced. The main classes are the *para*-phenylenediamines, vegetable and mineral dyes.

Para-phenylenediamine is probably, together with one or two kindred products, responsible for dyeing the very large majority of furs to-day. The colour produced varies quite considerably with the mordant used, and these dyes require the addition of an oxidising agent for the production of the shade. Great care is required in the rinsing after dyeing together with correct additions of unoxidising agent during dyeing, as should any free *para*-phenylenediamine be left on the fibre there is some risk of dermatitis being contracted by the wearer of the furs. With correct application, however, there is no risk whatsoever.

Vegetable dyes are, of course, nothing like so widely used to-day as in the past. Logwood, more generally purchased as hematein crystals, is used for producing black shades on certain furs, but probably the most frequently used vegetable dye now is gall nuts. The blue galls are of most interest, being those which are gathered before the young insects have bored their way through the shell. It is usual to roast these to a very dark shade of nigger brown, when they are ground and extracted with boiling water. It is possible to produce some exceedingly natural effects on the more expensive types of fur—such as the marten family—which remain remarkably fast to light.

Types of Mineral Dyes

Mineral dyes are of two types for use in fur dyeing. Those which dye the hair by their own action and those which require development by a second chemical to do so. Lead acetate can be used to illustrate both methods, and although it is still used to some extent, it is fast dying out, largely owing to the restrictions placed on its use from a health point of view. Lead acetate by itself will produce from pale to dark shades of brown by successive applications on white Indian lamb, for example. If an application of lead acetate is followed by ammonium sulphide, greyish tones are obtained. Proper control of these two chemicals is responsible for producing an imitation Krimmer lamb effect (a grey lamb with white tips to its curls), the whitening of the tips being produced by brushing on a weak solution of hydrogen peroxide. The acidity should be carefully watched when using hydrogen peroxide, otherwise the white tips will very quickly turn yellow.

It is now intended to particularise certain troubles which arise and their cure. In the first case the *para*-phenylenediamine bases are oxidation colours, and they cannot be called really fast. From the moment that they have been applied to the fibres a process of gradual oxidation by the air sets in, with the result that the colour slowly but surely changes—different combinations oxidise in different ways, but the usual result is a reddening of the hair which is most unpleasant. There is really no cure for this, but careful selection of mixtures can play an important part. Not long ago a certain firm produced a new colour on quite an expensive type of fur. It was very beautiful and received immediate support. Within one month the skins had changed out of all knowledge to a brownish green colour. On the other hand there are firms producing shades which will hold for two years, and although the colour reddens after this length of time it is not pronounced enough to be too objectionable.

Lightening Furs Dyed Too Dark

The more expensive furs are usually worked by hand, once the ground hair has been dyed. The dye solution is applied to the guard hairs by brush or feather, and the work is very skilled. What often happens, for a variety of reasons, is that the guard hair is dyed too dark. Once fur, for any reason at all has become too dark it is extremely difficult to lighten it, assuming that *para*-phenylenediamines have been used, as the usual oxidation methods do not apply, but merely have the effect of changing the colour in a somewhat similar manner to that of prolonged exposure. It is possible to use a reducing agent, such as sulphur dioxide, but there is always the risk that the colour will subsequently re-develop upon gradual oxidation. Probably the most efficient method for removing a slight amount of colour from the guard hairs is to use the old-fashioned permanganate-bisulphite bleach. This will, when properly controlled, lighten the colour without

reddening the hair to any appreciable extent. Strong solutions should never be used, it being far preferable to process skins several times if necessary. For general purposes a one per cent. solution of potassium permanganate should be brushed on the skins and allowed to remain for five minutes—the time is important, for if the permanganate is in contact with the hair for a longer period it becomes extremely difficult to remove. At the end of five minutes a five per cent. solution of sodium bisulphite, at a temperature of 32° C. is brushed on; the skins are allowed to dry and then brushed off.

The dyeing of ermine, which represents quite a large business, is by no means easy, and there are few firms who can handle this type of skin successfully. Obviously to obtain uniformity of shade on any fur is difficult, as each skin is inclined to differ in certain characteristics from its neighbour; this is most noticeable in ermine skins. A large parcel of skins, when dyed in the ordinary way will be found to contain five or six different tones of the required shade—a certain percentage will match the sample, others will be lighter, others darker. One way of overcoming this difficulty is by sorting after the initial dye bath. If the bath is carefully watched it should be possible in the first instance to remove the batch before any skins have gone darker than the sample. The remainder are sorted into their various colours, and placed at intervals, which can only be judged from experience, into a second colour vat, starting with the lightest in colour and working through to the darker ones. This sounds rather a cumbersome method, but with experience it will be found to work satisfactorily. Trouble is sometimes experienced with the dyed ermine acquiring a speckly appearance. This is usually due to an incorrect killing bath, and points to insufficient strength.

Indian lambs too can give trouble, in the same way as ermine, by coming out of the dyebath in a variety of tones Experienced dyers, however, can sort lamb skins in the natural state and can tell from the appearance of the hair which skins will dye more or less alike.

Fur dyers are up against a complaint known as singe, which has been receiving a certain amount of publicity for the first time. This is an affection of the guard hairs, causing them to curl over at the end. This spoils the appearance of any fur, and it is most usually caused by excessive heat; it can also be brought about by too strong a killing bath, and in certain cases it is found in the natural raw skins. Prevention can only be effected by efficient control of drying room temperatures and killing baths. Cure is by no means simple; in fact there is no really effective cure at present, although considerable research has been done on the problems. A moderately successful method, and one that gives fairly permanent results is the use of caraya gum. A one per cent. aqueous solution, to which ten per cent. of industrial spirit has been added, is applied to the affected hairs by means of a very small brush. The brush strokes should be in an upward direction and two or more applications may be found necessary; the skins should then be allowed to dry naturally, and not put in a drying room.

The following is a list of some of the chemicals used by fur dyers, together with the general purposes for which they are employed.

Pyrogallic acid is used in fair quantities for brightening certain *para*-phenylenediamines on the yellow-brown side. The dyeings obtained, however, are not particularly fast. Hydrogen peroxide is in high demand, being used almost solely as the oxidising agent for the *para*-phenylenediamine bases.

Calcium oxide, which should be bought as such, and not as calcium hydroxide, is used largely as a basis of killing baths, and is taken in large quantities. Sodium carbonate can be included under this heading, as well as ammonia, both of which are used for killing.

Sodium chloride is used by the dresser more than the dyer, as a large number of pelts are dressed with salt as an ingredient. The dyer, however, uses it to replace that unavoidably washed out of the dressing during the killing and dyeing processes and thus preserves a supple pelt. Potash alum again is of use to the dresser in tanning, and to the dyer for certain mordanting solutions. Ferrous sulphate is used in very large quantities, being the most general form of mordant used by the average fur dyer.

A certain number of vegetable dyes have been mentioned, such as hematein crystals and gall nuts. For use with these, mordants and developers such as litharge and ammonium chloride must be mentioned. Although ammonia has already been cited as a killing agent, it has another important use. A number of the *para*-phenylenediamine bases require an addition of ammonia in order to develop the shade, this being quite apart from the oxidising agent.

The bleaching process can be carried out either by reduction or by oxidation. Reducing agents such as sodium hydrosulphite and sulphurous acid have no lasting effect, and in the course of time the original colour will return. They are, however, decidedly cheaper to use than oxidising agents. The best known, and probably most effective, oxidising agent is hydrogen peroxide. (It should be remembered that the commercial solutions require neutralising before use with ammonia, as they are stabilised with acid). Sodium peroxide is a cheaper product to use, but the bleaching effect is not so good, tending to give rather a yellowish-white appearance.

A very good bleach can always be obtained with the old permanganate of potash bleach, in which the fur is treated with a weak solution of permanganate, followed by a solution of oxalic acid, sodium sulphite or sodium bisulphite. The only danger with this method is incorrect control of the permanganate solution, in which case the initial brown coloration, due to a deposition of hydrated manganese oxide, becomes extremely difficult if not impossible to remove. Hypochlorites should not be used, for although they are cheap and effective bleaching agents, they tend to attack the fibres, and while producing hair of great lustre, destroy all the soft feel and handle.

THE INSTITUTION OF CHEMICAL ENGINEERS

The President's Reception of the Institution of Chemical Engineers was held at the Waldorf Hotel, London, W.C.2, on Thursday, when the guests were received by Dr. William Cullen, President, and Mrs. Cullen, O.B.E. Among those who accepted invitations to be present were: Viscount Leverhulme, Sir Frank and Lady Smith, Sir William and Lady Alexander, The Mayor and Mayoress of Westminster, Dr. and Mrs. E. F. Armstrong, Mr. and Mrs. Horatio Ballantyne, Prof. and Mrs. H. V. A. Briscoe, Mr. and Mrs. H. J. Bush, Capt. W. H. Cadman, Mr. W. A. S. Calder, Mr. and Mrs. W. A Damon, Prof. and Mrs. C. H. Desch, Prof. F. G. Donnan, Dr. F. P. Dunn, Dr. and Mrs. T. H. Durrans, Prof. A. C. Egerton and the Hon. Mrs. A. C. Egerton, Dr. H. J. T. Ellingham, Dr. and Mrs. J. Vargas Eyre, Prof. and Mrs. G. I. Finch, Dr. and Mrs. J. J. Fox, Mr. and Mrs. C. S. Garland, Mr. and Mrs. F. A. Greene, Dr. and Mrs. W. H. Hatfield, Dr. and Mrs. L. A. Jordan, Dr. and Mrs. L. H. Lampitt, Mr. W. le Maistre, Mr. and Mrs. Julian M. Leonard, Dr. R. Lessing, Dr. and Mrs. Herbert Levinstein, Prof. and Mrs. D. M. Newitt, Prof. and Mrs. J. C. Philip, Mr. and Mrs. H. J. Pooley, Mr. H. V. Potter, Mr. J. Davidson Pratt, Mr. and Mrs. Eric Reavell, Mr. and Mrs. Stanley Robson, Mr. James F. Ronca, Mr. and Mrs. William Russell, Mr. J. Sutherland and Miss Joan Sutherland, Prof. and Mrs. Jocelyn Thorpe, Dr. A. J. V. Underwood, and Prof. and Mrs. S. G. M. Ure.

NEW RUBBER SUBSTITUTE

A Dayton (U.S.A.) chemist has announced the discovery of a new type of rubber substitute. It is obtained by heating a mixture of wood oil and glycerine to a temperature of 450° F. The resultant mass can be vulcanised and mixed with natural rubber. It has the advantage over the natural product of being unaffected by oils, greases or petrol, as well as by alkalies.

Lac Research

Importance of High Quality Products—Annual Report of the London Shellac Research Bureau

DESPITE the fact that the total lac exports from India to foreign countries fell from 833,964 cwts. in 1936-37 to 655,171 cwt. in 1937-38, the year 1937-38 has been the fifth highest exporting year for lac since 1920-21, states the annual report of the London Shellac Research Bureau. The United States of America, plus the United Kingdom, took somewhat over 60 per cent. of the total exports of lac from India in the year under report, while the ratio of exports of seedlac to shellac remained about the same, at roughly 30 per cent. and 60 per cent. of the whole for 1936-37 and 1937-38. The dropping away in the exports of lac from India was most marked in the last quarter of the year under report.

There is evidence of the higher quality of the products exported and if this can be continued and improved upon, the future of lac in India is assured. There is a demand, more especially in the United States of America, for a well-washed seedlac for use in the great lac bleaching industry in that country. This requirement is also marked in the United Kingdom and in Europe. An adulterant-free shellac would meet many requirements of the lac-consuming trades of today. Rosin and orpiment are not necessary at all and their presence, more especially where the lac is being used for lacquers and varnishes in food containers, sweets, etc., is absolutely dangerous.

Synthetic Resin Industry

As research work on lac expands it becomes more and more apparent that for certain uses synthetic resins hold the field and will continue to hold the field. To give a few instances, the synthetic resins are likely to dominate the field of mouldings of the closed mould type; lac cannot hope to compete with resins of high melting point, nor can it do much in competition with resins of outstanding weather-resisting properties. Experiments with injection mouldings using various lac moulding powders have given encouraging results. Provided the Indian lac producer takes to heart the lesson that lac products must be delivered in their best, unadulterated and fresh condition there is ample room for lac and other natural resins in consuming industries, the expansion of the synthetic resin field notwithstanding. In view of the detailed information given about the synthetic resin industry in the annual report for 1936-37 the section in the current year's report is being curtailed.

Lac Research in the United Kingdom

The preparation for the second period of research work in London having been well planned, the progress of research at the Ramsay Laboratories has been satisfactory. A simple method of separating lac into fractions individually more or less polymerised has been developed. Lac, like all polymeric materials, can be looked upon as an isogel consisting of molecules more or less similar in chemical composition and structure, but differing in size and state of polymerisation. Physical and mechanical properties such as elasticity, hardness, melting point, solubility and viscosity of the solutions, and properties of the films depend largely on the size of the molecules and their state of polymerisation. In particular, the less polymerised materials have greater solubility and lower melting points. Uniformity of the molecules is a desirable quality but is difficult to achieve. W. Nagel suggested the name " Pure Lac Resin " or " Reinharz " for the group component of lac insoluble in ethyl ether. It is doubtful, however, if even this fraction of lac consists of uniform molecules. The London Shellac Research Bureau has fractionated lac by partial extraction with solvents such as toluene and trichlorethylene and found the insoluble fraction had a higher softening point and superior film-forming properties. The Indian Lac Research Institute did similar work by the acetone-urea process. This improved form of lac was generically designated as " Hard Lac Resin," to distinguish it from the " Reinharz."

Later, it was shown by R. Bhattacharya and B. S. Gidvani that shellac could also be separated into two parts by extraction with hot, dilute solutions of weak alkalies such as sodium carbonate, borax and ammonium di-hydrogen phosphate. In this way the more acidic components of the lac were removed, and it was found that the insoluble resin had improved properties, similar to those of the " Hard Lac Resin " obtained by already described solvent-extraction processes. Since, however, these two hard lac resins are not yet undisclosed, it has been suggested that the term " Sclerolac " should be applied to the alkali-extracted lac. As this term has not, so far, been popularised the term " Hard Lac Resin " still indicates the mainly ether-insoluble and the term " Soft Lac Resin " the ether-soluble fraction of the lac complex.

The cheapness of the alkali-extraction process will probably lead to its wide adoption for manufacturing commercial " Hard Lac Resin." At the time of writing, a firm in Germany is employing the toluol extraction method for putting on the market a product under the name of " Tempered Lac "; another firm in London, an as yet undisclosed process (patent applied for) for manufacturing a proprietary brand of " Hard Lac Resin "; an American firm is using a modified toluol extraction process and a German electrical appliances company has patented the ether-extracted lac product for use as a binder in mica bonded material. One important use for the by-product, the " Soft Lac Resin " has been found; others are under investigation.

The Alkali Extraction Process

The alkali extraction process deserves further mention. The procedure consists in soaking powdered lac in aqueous alkali at temperatures below 40° C. and subsequent centrifuging or filterpressing and washing with water. It is possible by this means to obtain fractions with lower acidity and higher softening points. Further, the more highly polymerised fractions become more difficultly soluble in alcohol. In fact, 40 per cent. of the resin fraction can be made soluble only by using Sextone B, or diacetone alcohol in admixture with industrial spirit.

Another very important development has been the combination of lac with fatty and other acids. Several practical methods of making lac-drying oil varnishes and their products have been studied. It has been found possible to esterify the hydroxyl groups of lac with suitable acids. The properties and possible uses of these esters are under investigation.

The effect of lac and the esters on the viscosity and other properties of nitrocellulose lacquers, has been observed but only a part of the projected scheme has been studied. When completed, these experiments will furnish the manufacturers of lacquers and spirit varnishes with useful data.

The work on the constitution of lac had to be suspended owing to the necessity to devote much time to less theoretical work. Nevertheless, an unidentified new methyl ester, with 79-80° C. melting point and an acid melting at 150° C. have been isolated during the course of the preparation of shellolic acid. The hydroxyl and the saponification values of lac and lac compounds had to be investigated in connection with the other work in hand. Investigation of the shellac wax has shown that the composition of the total wax is as follows: Hot alcohol-insoluble wax ester, 16 per cent.; hot alcohol-soluble wax ester, 25 per cent.; hot alcohol-soluble wax alcohol, 59 per cent. Apparently Chibnall and others

(*Biochem. J.*, 1934, *23*, 2,175-2,219) only examined the wax alcohol part.

The possibility of hot-spraying powdered lac has been investigated. It has been observed that satisfactory spraying on certain surfaces, particularly concrete, wood and paper, can be accomplished. The hot-spraying of dry lac on paper as a preliminary to preparing laminated tubes, etc., opens up an interesting field in electrical insulation technique.

During the year certain *ad hoc* research work was undertaken, including an analysis of the shellac, button lac and seedlac standards adopted by the London Shellac Trade Association; these analyses have been published and made available to interested parties. At the request of various firms in the United Kingdom, Europe and Australia the Special Officer Lac Inquiry obtained the co-operation of the Imperial Institute and other analysts in analysing bleached lac with a view to improving the minimum moisture content, softening point, acid number and retained chlorine per cent., with the result that improved products have been put on the market in several cases. In co-operation with a French polisher of considerable scientific training, progress has been made in producing French polishes resistant to water and fairly high temperatures. Another French polish expert has produced very satisfactory pigmented French polishes, which give promise of wide household use as against enamels. In this work both whole shellacs and " Hard Lac Resin " have been used, the latter showing superior performance; " crazing " has not yet been entirely overcome; the ideal plasticiser for lac is still being sought; urea has been a beneficial ingredient in the above processes.

The development of lac-mono- and polyglycerides of drying oil varnishes, already referred to, has been made possible by the whole-hearted co-operation of a firm specialising in drying oils (*J. Oil. Col. Chem. Assoc.*, 1938, *21*, 96-100). Lac-nitrocellulose lacquer combinations are showing notable progress, due again to the willing co-operation of several large firms.

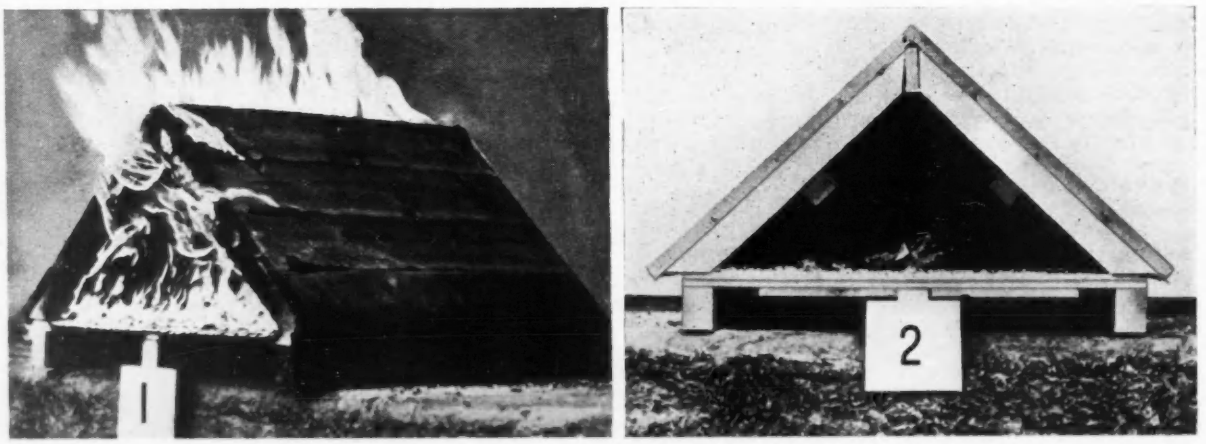
As regards co-operative work between firms and the London Shellac Research Bureau, sponsored by the Indian Lac Cess Committee, the Metropolitan-Vickers Electrical Co., Ltd., have continued along the lines reported by the Special Officer Lac Inquiry in his Annual Report for 1936-37. The development of a simple alkali-extraction process for " Hard Lac Resin " resulted in the holding up of the project to develop the manufacture of this product by means of toluol and other solvents, though, as already mentioned, such a resin is being marketed. A perusal of the progress reports of the Metropolitan-Vickers Electrical Co., Ltd., shows that considerable progress has been made, the most noteworthy of which is the success of a " Hard Lac Resin " urea-micronised-mica-filler injection moulding powder. These mouldings after an eighteen-hour cure at 130° C. (Met. Vick. Res. Report No. 8,311 of April, 1938), a temperature which could be raised very considerably with advantage, showed a softening point of 96° C., water absorption after twenty-four hours of 0.78 per cent., and impact strength of 2.84 kg. cms./sq. cm. and an electric strength value of 343 volts per mil at 20° C. and 358 at 60° C. These experimental figures are very striking and more work on the subject will be done as expeditiously as possible.

Incendiary Bomb Fires

Localisation by New I.C.I. Product

IT is the opinion of experts that one of the most likely and most dangerous forms of air-attack on cities would be a rain of small incendiary bombs. These are likely to be of about 2 lb. weight and to burn with a terrific heat, at times reaching some 3,000° F. In a few seconds they produce a mass of molten iron and continue burning for about 10 minutes. Some of the burning fragments may be shot off to a distance of several feet. A mineral paint, based on calcium sulphate (anhydrite), which has a remarkable effect in controlling fire from incendiary bombs has now been introduced by Imperial Chemical Industries, Ltd.

The new product, known as Pioneer fire-resistant finish, enables the effect of the incendiary bomb to be localised after it has penetrated the roof and come to rest on the floor of the loft, attic or upper room. Tests seem conclusively to have proved its ability to do this. They have shown that small incendiary bombs discharged within wooden models of roof spaces spent themselves without the structure catching fire if it was coated with the new finish. Whether extinction or valuable retardation of fire would occur in practice depends largely upon the size and severity of the bomb. If all exposed woodwork above the wooden floor on which the bomb is stopped and the floor itself is coated to a thickness of 1/16 of an inch a high degree of retardation of fire caused by small incendiary bombs is assured. Application is simplicity itself. The fine grey-coloured powder is thoroughly stirred into lukewarm water to a specific consistency, and then put on with an ordinary wall-brush.



Fifteen minutes after the explosion of an incendiary bomb. 1.—Model attic of untreated wood burning to destruction. 2—Model attic of wood treated with $\frac{1}{16}$ in. Pioneer fire-resistant finish.

Canada's Chemical Trade

Increase of Business Transacted with the United Kingdom

THE year 1937 was for Canada a period of great industrial and commercial activity, although there was a decline in December due largely to the recession in business in the U.S.A., states a report on Economic and Commercial Conditions in Canada (1937-38) published by H.M. Stationery Office for the Department of Overseas Trade. Exports of chemicals and allied products from Canada during the fiscal year ended March, 1938, were valued at $20,926,267 as against $19,237,697 for the previous year, of which chemicals to the value of $5,144,611 were exported to the United Kingdom, compared with $4,191,193 in the year ending March, 1937. Total imports of chemicals and allied products increased from $33.1 millions in the year ending March, 1937, to $36.8 millions in the following year. The imports from the United Kingdom increased from $6.9 millions to $7.7 millions.

Import Statistics

The imports of some of the principal chemicals and allied products in the years ending March, 1937 and 1938, and the shares of the trade obtained by the United Kingdom and the U.S.A. are shown in the following table.

(*In thousands of dollars.*)

	Total Imports.		*Imports from United Kingdom.*		*Imports from U.S.A.*	
	1936-7	1937-8	1936-7	1937-8	1936-7	1937-8
Acids	1,473	1,971	550	668	696	1,053
Nitrate of ammonia	182	376	172	371	6	4
Cellulose products	1,880	1,819	132	83	1,673	1,633
Drugs and medicines ..	3,274	3,495	816	851	1,731	2,028
Dyeing and tanning materials ..	5,975	5,114	683	694	2,254	2,222
Fertilisers	2,643	3,458	51	33	1,691	1,977
Glycerine	306	442	106	50	30	138
Paints, pigments and varnishes ..	4,497	4,603	1,555	1,801	2,522	2,349
Perfumery, cosmetics, etc. ..	433	475	142	158	215	242
Soap	561	527	108	133	379	312
Sodium compounds	2,423	2,825	1,017	1,070	1,252	1,620

The total imports of drugs, medicinal and pharmaceutical preparations were valued at $3,495,036 in the year ending March, 1938, and $3,274,066 in the previous year. The United Kingdom's share of the trade increased from $816,147 in 1936-7 to $851,865 in 1937-8, while that of the U.S.A. increased from $1,731,719 to $2,028,504. There were 169 factories in Canada in 1936 engaged chiefly in making patent and proprietary medicines, pharmaceuticals and similar commodities and the total production in that year was valued at over $22 million at factory prices. The estimate of production for 1937 is over $24 million.

U.K. Share of Canadian Dye Imports

Total imports of dyeing and tanning materials amounted to $5,114,017 in the year ending March, 1938, compared with $5,975,440 in the previous year. Imports from the United Kingdom increased slightly from $683,293 in 1936-7 to $694,930 in 1937-8, and in the same period imports from the U.S.A. declined from $2,254,144 to $2,222,133. Aniline and other coal-tar dyes account for nearly two-thirds of the total value of these imports and in the year ending March, 1938, the U.S.A. displaced Germany as the principal supplier. Germany and Switzerland supply the bulk of the finer dyes. Imports from the United Kingdom of aniline and coal-tar dyes amounted to $454,160 in 1936-7 and $434,563 in 1937-8. It is thought that the United Kingdom should be able to secure a greater share of the import trade in the extract of logwood and fustic. Imports of this commodity totalled 597,189 lb. valued at $57,392 in 1937-8 of which 534,071 lb. valued at $52,397 were from the U.S.A. and 62,768 lb. valued at $4,894 from the United Kingdom.

The total imports of paints, pigments and varnishes in the year ending March, 1938, were valued at $4.6 millions, of which $1.8 millions were from the United Kingdom and $2.3 millions from the U.S.A. The total imports in 1936-7 amounted to $4½ millions. There is a large paint manufacturing industry in Canada which supplies practically the whole market with the result that the imports mentioned above are chiefly ingredients used in the manufacture of paints. According to the latest detailed figures available (for 1936) there are some 78 plants in the paint industry in the Dominion, of which 36 are in Ontario and 22 in Quebec. The value of the paint production in 1936 was over $22½ millions and the estimate for 1937 is over $24 millions.

The more important chemical pigments imported, and the share of the trade obtained by the United Kingdom in the years ending March, 1937 and 1938, are shown below:—

(*In thousands of dollars.*)

	Total Imports.		*Imports from United Kingdom.*	
	1936-7	1937-8	1936-7	1937-8
Litharge ..	141	181	81	94
Antimony oxide, titanium oxide, etc.	491	496	235	227
Carbon black	690	609	3	3
Lithopone	696	742	301	382
Tin and copper oxide	80	110	52	62
Oxides, fire proofs, rough stuff, fillers, and dry colours, n.o.p. ..	788	797	187	218
Ultramarine blue	57	64	35	42
Zinc white	591	650	408	510
Ochres, ochrey earths, siennas and umbers	53	54	9	7

It is thought that the United Kingdom should be able to secure a larger share of the trade in oxides, dry colours and ochres. The bulk of the imports of these products at present comes from the U.S.A. In all earth oxides strict standards are adopted by Canadian buyers and it is necessary to conform to these in order to secure business.

Trade Matters in Parliament

A Suggested Munitions Supply Council

IN the House of Commons on November 17, Sir Arnold Gridley suggested that instead of setting up a full Ministry of Supply at the moment, a Munitions Executive Supply Council should be established. This would consist of some 10 or 12 members, the chairman of which would be a technical expert from outside the Service Departments and outside politics, whose name would bring confidence at once to the country, to the House and to the Departments. On this council would sit one technical expert from each of the Defence Services and from the Ministry of Labour, and it would include also one or more representatives of the trade unions, the rest of its members being technical experts drawn from the big munition industries themselves.

Beet Sugar Industry (Subsidy)

Major Carver, in the House of Commons on November 17, asked the Minister of Agriculture what amount had been paid out in respect of the beet sugar subsidy since the inception of the scheme; and what part of this sum was estimated to have reached the farmers growing sugar beet as opposed to the beet sugar factory interests?

Mr. W. S. Morrison replied: the total amount of subsidy paid to the beet sugar industry in this country since 1924 is approximately £41,000,000. Any apportionment of the benefit of the subsidy between growers and factories would necessarily be highly speculative, since it would involve an estimate of what would have been the price of sugar beet had no direct Exchequer assistance been afforded to the industry.

Principles of Drying

Fundamental Considerations for Efficient Operation of Drying Plant

AT a meeting of the Manchester Section of the Society of Dyers and Colourists held on November 18, in Manchester, two papers on drying were read. The first, entitled "Some Principles of Drying," was read by Mr. W. Cowen, M.Sc., A.M.I.Chem.E., who stated that the operation of drying by means of air currents was of great importance at some stage of many industrial processes, and a knowledge of the fundamental principles on which the operation was based was necessary if the best results were to be expected in the performance of existing plant and if improvements were to be obtained in new designs.

The rate of moisture removal was dependent on several factors which could conveniently be divided into two groups. One group embraced the physical properties of the material being dried, the other group included the external factor known as the drying conditions. The drying conditions included the temperature, relative humidity and velocity of the air, the relative geometrical arrangement of the drying substance and the air stream, and the presence in the dryer of heat-radiating and conducting bodies.

When any substance contained water, a vapour pressure was exerted at the surface corresponding to the temperature of the system, the water content, and the physical properties of the substance. Vapour pressure curves had been obtained for a number of substances. The curves were sinusoidal, and for solids became parallel to the (moisture content) abscissa at a finite moisture content. The constant vapour pressure above this critical moisture content was that of water at the temperature of the stock; for example, at 20° C. the vapour pressure of any wet stock was 17.589 m.m. Hg, the vapour pressure of water at this temperature. At any other temperature, the constant vapour pressure of wet materials could be ascertained from tables of saturated pressures of water vapour. The air used for drying was seldom bone dry. It was usually mixed with water vapour, and therefore humid, and there would be a water vapour pressure for the mixture. The changes in the state of air-water mixtures used in drying could be followed conveniently by using a psychrometric chart.

There was an important physical phenomenon experienced when fluids flow. The particles contituting a moving fluid stream would conform to one of two types of motion: streamline or turbulent. In streamline motion the paths of the fluid could be predicted with precision by mathematical analysis. When the fluid motion was streamline the rate of heat transmission by the fluid could be calculated correctly, co-efficients of surface heat conductance could be predicted, and the surface conductance to be expected from a condensing vapour when the condensate formed a film on the cooling surface could be calculated with great accuracy. The rate of transfer of material by diffusion might be predicted without great difficulty when the fluid through which the material diffused was in streamline motion.

When the fluid stream was turbulent the paths of the particles could not be analysed mathematically. The particles which at one instant of time were in one set of positions were at the next instant in another set of positions entirely unconnected with the first. The particles might have, at any instant, a large velocity component at right angles to the direction of the mean mass motion, and there was in consequence a marked mixing effect. This turbulence was of great assistance in increasing the rate at which energy in the form of heat, or matter could be transferred to remote parts of the system. Even with turbulent flow the mixing motion of the particles did not extend completely through the fluid mass. It had been proved that when any fluid moved relative to a solid surface a film existed adjacent to the surface which was in general entirely different in character from the main stream of the fluid.

This fluid film or boundary layer formed a zone between that part of the fluid in turbulent motion nd the surface. The fluid in the boundary layer adhered to the surface, and the motion in the boundary layer was laminar or streamline and parallel to the solid surface. This fluid acted towards the transfer of momentum energy and matter as though it was composed of a different substance from that which constituted the turbulent mass. These boundary layers were also formed at the interface between two fluid phases as, for example, when a gas was moving over a liquid. Under these conditions a boundary layer was formed in both phases.

In many processes the initial drying rate had to be slowed down to prevent too quick drying of the surface material with consequent surface shrinkage and case hardening and sometimes cracking of the surface. The case hardening of a material slowed down the subsequent drying rate as well as impairing the quality of the products. The initial drying rate for a material showing this tendency might be slowed down, even if the drying was carried out at a fairly high temperature, if the drying air was charged fairly heavily with water vapour, as this reduced the driving force for evaporation. The air mixture might be made fairly wet by re-circulating some of the air which had already been passed through the drier, and which had picked up moisture during a previous passage.

The second paper "Textile Drying Machinery," read by Mr. W. W. Spooner, M.A., M.I.C.E., described the operation of a considerable number of drying machines for use in the textile and other industries.

THE ANNUAL CHEMICAL DINNER

The annual chemical dinner, held at the Connaught Rooms, W.C.2 on Tuesday, was attended by more than 250 members of the different branches of the chemical industry and their guests. The dinner, again efficiently organised by Mr. F. A. Greene, was held under the auspices of the Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, the Society of Dyers and Colourists, the Society of Public Analysts, the Faraday Society, the Biochemical Society, the Institution of Chemical Engineers, the Institute of Petroleum, the Oil and Colour Chemists' Association, the British Association of Chemists, the Association of British Chemical Manufacturers, and the Chemical Club. After dinner, the loyal toasts were proposed by Professor F. G. Donnan, followed by dancing until midnight. Among those present were: Professor H. V. A. Briscoe, Mr. H. J. Bush, Mr. W. A. S. Calder, Dr. William Cullen, Dr. T. H. Durrans, Mr. Bernard Dyer, Dr. H. J. T. Ellingham, Professor G. I. Finch, Dr. L. H. Lampitt, Mr. J. M. Leonard, Mr. Richard B. Picher, Mr. J. Davidson Pratt, Dr. F. L. Pyman, Mr. B. N. Reavell, Mr. E. A. Reavell, Mr. W. Russell, Mr. N. Swindin, Professor J. T. Thorpe, Mr. I. E. Weber, Mr. W. Lloyd Willey and Mr. C. B. Woodley.

INSECTICIDE FROM PYRETHRUM

The Public Health Commissioner with the Government of India recently brought to the notice of the Imperial Council of Agricultural Research the desirability of investigating a non-arsenical insecticide for use in the anti-malaria campaign, and suggested the use of pyrethrum. The cultivation of this plant had till recently been done entirely in Japan. In the last few years Kenya has been able to grow the plant and to produce material of highly insecticidal value from it. It has been decided that experiments should be carried out in about two dozen suitable localities in India with a view to ascertain whether pyrethrum of high insectical value can be economically produced in India.

Problems of the Leather Trades Chemist

A JOINT meeting of the London Section of the Oil and Colour Chemists' Association and the British Section of the International Society of Leather Trades Chemists was held at the Federation of British Industries on November 18, when two papers were read and discusused. The Chair at the opening of the meeting was taken by MR. A. J. GIBSON (President of the Oil and Colour Chemists' Association) who welcomed the members of the British Section of the International Society of Leather Trade Chemists and then vacated the chair in favour of DR. R. H. MARRIOTT, Chairman of the British Section of that body. Dr. Marriott expressed appreciation of the opportunity of holding this joint meeting and of laying before the oil and colour chemists some of the problems of the leather trades chemists.

Properties of Water Pigment Finishes and their Influence on Leather Finishing

THE first paper was "Some Properties of Water Pigment Finishes and their Influence on the Finishing of Leather," by MR. J. A. GILMAN. The author pointed out that one of the difficulties most frequently met with in pigment finishing was that of adhesion. This, however, was not in every case a question of the formulation of the finish, as cases often occurred where perfect adhesion was obtained by normal application on seven leathers out of ten, but in the other three trouble was experienced. The difficulty then arose of tracing the cause. There were certain more apparent causes, such as patches of grease and resistance to wetting of the surface.

Assuming these to be absent, there remained the possibility of absorption of plasticiser by the leather, and actual precipitation of the binder. In view of the nature of the constituents of a water pigment finish, precipitation could occur due to the presence of excess of acid or neutral salts. Further, the trouble might not be due to a single cause but to a combination of several. It was in this connection that some standard figures on the degree of compatibility of a finish, say, to acidity or salt concentration, would be helpful. Unfortunately, such figures with regard to the finish itself would not be entirely useful since in the application of the finish, especially in padding or brushing, the action was localised.

Some experiments made to determine the degree of acidity to which vegetable tanned leather could be taken without causing trouble in the application of the pigment finish, gave somewhat contradictory results. This was due partly to difficulties in technique in the application of the finish evenly on the relatively small pieces of leather. In application by pad, all the treated pieces showed resistance to penetration; on pieces sprayed only, this was not apparent. The actual adhesion did not appear to have suffered materially on the sprayed pieces, though a very matt effect was produced. The results could not be regarded as conclusive since it was found that much larger samples of leather would have to be used. The difficulty then arose of getting large pieces of leather (which of necessity would be from different skins) of the same texture and grain of surface.

The author concluded with expressing the view that some standard tests were necessary for adhesion, to take the place of the haphazard tests now used. It seemed that the leather had a very big influence on the finish applied to it.

DISCUSSION

THE CHAIRMAN, DR. R. H. MARRIOTT, commenting on the special attention paid by the author to the problem of absorption of the plasticiser by the leather and actual precipitation of the binder, and also to the prevention of powdering, said that in order to assist their friends, the oil and colour chemists, it might be as well to emphasise to them that leather was a very peculiar product. The skin of the leather was taken from an animal and its texture varied over the whole of the area. Furthermore, it was a fibrous texture and very absorbent to moisture and therefore it would readily be appreciated that in applying a water pigment finish, some of the aqueous media was absorbed and that might spoil the appearance of the original pigment finish. Again, leather was always acid and a slight variation of the *p*H value could have marked effects on the physical properties. It was one of the big problems of the tanner that results on small pieces of skin might result in the tests being quite misleading so far as the whole surface was concerned.

MR. D. WOODROOFE said it would be interesting to know whether the author, in speaking of standardisation, was doing so from the point of view of the oil and colour chemist or the leather trades chemist, as he was connected with both sides. The point was, however, that before beginning to think of standardisation it was necessary to have a standard leather, and the leather people should seriously consider getting a little standardisation in their product. He had carried out investigations which indicated very great variations in the *p*H value of the original vegetable tanned leather.

Importance of the Leather and Finish Acidities

DR. COLIN RUSS pointed out that both the *p*H value of the leather and of the finish required investigation. He related a case in which a light blue leather had given patches of whiteness and said the solution in that instance was to adjust the *p*H value of the finish. By so doing, it had been possible completely to mask the whiteness produced by the lowest *p*H in any part of the skin. He believed that that would always be found the easiest way, namely, to have a standard finish and to specify as far as possible in what way the *p*H could be modified by the addition of certain materials. In that connection he suggested they should not forget that very useful substance, buttermilk.

MR. R. BHATTACHARYA suggested that by testing a finish on a number of samples of leather it might be possible to standardise certain finishes and perhaps arrive at certain standards for tests.

MR. A. HARVEY suggested that a technique for the examination of the stability of a pigment finish towards a given leather would be to agitate a finely divided leather with the slightly diluted pigment and then note any alteration in the *p*H of the diluted pigment finish and also note any change in dispersion by means of miscroscopical examination.

MR. MUDD expressed the view that adhesion was definitely a surface phenomenon and said that a great deal depended on the different groupings which were presented to the surface of the leather and also what the pigment finish presented to the leather. Another factor which was even more important than acidity, particularly with water pigment finishes, was the presence of a boundary layer of grease in the leather structure. In certain phases of the manufacture of leather, soap was formed and the fatty acids were bound to split up and spread in an extremely fine film which gave more trouble than the acid.

MR. D. WOODROFFE said he did not wish unduly to stress the question of acidity but he urged it was a point which required consideration in connection with the preparation of leather. Some speakers had suggested there was no need to bother about the leather and said that the finish should be fitted to the leather. It was to be hoped the oil and colour chemists would have something to say about that. If they were going to have thousands of finishes to suit all the different kinds of leather, the leather people would be very happy

but he did not know whether the oil and colour people would!

DR. S. H. BELL said he detected in the discussion a sort of greasy layer versus pH controversy but personally he did not think the two things were opposed. Indeed, he thought they were complementary; it seemed to him that in a case like this there were three and not two parties to the contract. There was leather and the pigment and its medium, and in between there was the layer of grease or fatty acid residues from the processing. Surely adhesion depended on what that layer was and how it was orientated and what its molecular strength was, and that must be determined by the acidity of the leather. It seemed to him that more would be learned about this problem if more was known about the orientation of that surface layer and that information could be obtained by contact angle measurements of selected liquids and the effect of contact angle on the various pH values of these liquids.

MR. KING suggested that the important thing in regard to finishes was pre-treatment and unless the greasy layer was absolutely necessary it would be a good thing to remove it altogether. That could be done by means of a solvent or in some other way. It had been suggested there should be an under-coat and that might be another way.

MR. MUDD, referring to the question of the boundary film of fatty acid, said he had carried out some tanning tests a short time ago and the results suggested that these boundary films were extraordinarily difficult to shift, even with an alkaline medium. Indeed, it seemed easier to emulsify a non-polar oil than it was to saponify a very thin film of fatty acid. That might throw some light on the matter.

MR. MERRITT, who said he was a leather dresser, remarked that he found by experience that by varying the binders it was possible to overcome the trouble of adhesion quite easily, and there were one or two binders on the market which seemed to answer in every case. A point he said he would like to remind chemists of was that leather was made to be sold at 4d. or 5d. per foot and therefore the leather manufacturer could not afford a de-greaser and other refinements which had been commented upon. Therefore, he contended that it all came back to the pigment makers as the leather makers could not do it themselves.

MR. GILMAN, replying to the discussion, said that while it was possible to get over many of the difficulties of adhesion by varying the binders, the fact remained that it was of interest to the pigment manufacturer to know why he had to vary the binder, because if he knew that, it was very much easier for him to make a suitable binder straightaway. With regard to the possibility of adding alkali to the finish, a suggestion which had been made, it was necessary to take into account that other properties might be affected, such as viscosity and fastness, if there was an excess of alkali present. He agreed with Mr. Mudd that the question of the addition of alkali to saponify a fat was not very simple and he did not think the addition of an alkali would saponify the fatty acid formed in this case.

With regard to testing a finish, he said he did not think the use of shredded leather would give much information as one was dealing with surface acidity and not that of the entire leather substance. As to the possibility of bacterial action, he doubted whether the time of drying was sufficiently long to allow bacterial action to come into play. As to the looseness of dry rubbing, he had no explanation to offer for that unless there was the possibility of breakdown of the lake; sometimes there was loose dry material present which might be more easily rubbed.

It was difficult to get direct evidence that acid affected adhesion to a very marked extent, but the important point was that difficulties existed and it was natural to assume that if there was lack of adhesion it could be corrected by the addition of alkali.

Some Problems in Water Pigment Finishing

IN the second paper, which dealt with "Some Problems in Water Pigment Finishing," DR. CONMAR ROBINSON said that after application of the liquid finish to the leather, the binders which were included in its composition, set up a gel. The pigment particles would then be in a state of dispersion in this gel. It followed that the properties of the resulting gel would largely decide the fastness to set rubbing. Formaldehyde, when added to a sufficiently concentrated solution of casein, converted it to a gel, but the minimum concentration at which gel formation took place increased on decreasing pH. This might suggest that formaldehyde fixing would be more efficient at high pH. In practice, however, acid was frequently used. The explanation might be that when a film dried, one was concerned with the concentration at which it first set to a gel. The practical advantage obtained with acid suggested that a film with final properties which were more suitable to good fastness was obtained when this minimum concentration was not too low. This was being further investigated and a reproducible wet rubbing test had been developed for this purpose. This test also allowed ageing of the finish to be studied. The final pH of the finish would only be reached after diffusion had taken place into and from the leather. This was no doubt a factor in determining ageing. Another factor was probably to be found in the properties of albumen, which, unlike casein, formed gels which set slowly, days being necessary in some cases.

DISCUSSION

THE CHAIRMAN, speaking on the question of ageing, said the paper had pointed out that a pure film of casein, without any pigment in it, did not seem to age at all, and the author had asked what might be the factors dominating the ageing which was obtained in practice when pigments were present. It was known that certain insoluble materials, such as sulphur and various colloidal precipitates, could tan leather, and it seemed to him quite unlikely that conditions might arise during the drying of a film whereby some of the insoluble pigment particles, depending on the activity of their particular surfaces, might produce a tanning effect, except after a considerable period of time. That was rather indicated in the paper.

MR. EARNSHAW suggested that the use of formaldehyle for fixing was becoming out of date and said he had found that both casein and albumens aged. He asked if the author had made any experiments with chrome salts which he hinted were replacing formaldehyde.

DR. ROBINSON said that experiments on chrome salts were being carried out, but they had not gone very far yet. So far as the work had gone, however, there had been extraordinarily little difference between the use of chrome salts and formaldehyde. The question, however, was complicated by many factors. As far as ageing was concerned, he had been speaking in the paper of a period of a change that had taken place in a few days. There had been no great difference in the fastness after one day, and that was what he had meant by ageing.

MR. MUDD said the author had raised the point of rendering casein insoluble by treatment with formaldehyde. That suggested a resin formation between the casein and the formalin. From his experience, formaldehyde worked best on the acid side. In the same way, the steaming treatment of a casein film offered ideal conditions for resin formation.

DR. ROBINSON said he thought Mr. Mudd was right in the view he had expressed, as it had been found from viscosity measurements, even in dilute casein solutions where there was no gel formation, that there was a very significant increase of viscosity. It therefore seemed reasonable to assume, whatever the nature of the reaction, there was an indication of the coupling up of two or more molecules giving more long shaped particles, which was the only way in which an increase of viscosity could be accounted for. That point was being investigated at increased temperatures.

Anglo-American Trade Agreement

Concessions in Rates of Duty on Chemical Products

THE Anglo-American Trade Agreement was signed last week after nine months of negotiation. It relates not only to the United Kingdom, but also to Newfoundland and the Colonial Empire, and will operate for an initial period of three years. After that it will be subject to termination on six months' notice by either Government. The tariff concessions by the United States, the United Kingdom, and Newfoundland will come into force on January 1, 1939, and the concessions by the Colonies as soon as practicable after that date.

General Plan of the Agreement

The Agreement, which bears the signatures of Sir Ronald Lindsay, the British Ambassador in Washington; Mr. Arnold E. Overton, a Second Secretary to the Board of Trade; and Mr. Cordell Hull, Secretary of State of the United States, consists of 25 articles and four schedules setting out in detail the concessions made by the United Kingdom, Newfoundland, the British Colonies, and the United States. A provision is included (Article 18) to permit of the termination of the Agreement if there should be a wide variation in the pound-dollar rate of exchange, and if, after consultation, the parties fail to agree on modifications of the Agreement to meet the new state of affairs. Another provision, usual in United States treaties but never before incorporated in a United Kingdom treaty, is to be found in Article 19, which permits modifications of the Agreement in respect of any particular kind of goods if some other country obtains the major benefit from the particular concessions, with the result that serious injury is threatened to the interests of the importing country. Provisions as to dumping and export bounties are included in the articles dealing with scheduled goods.

Some indication of the scope of trade covered by the tariff concessions under the Agreement is given by the length of the schedules. The tariff concessions accorded by the United States to the United Kingdom, Newfoundland, and the Colonies are set out in a schedule which numbers some 600 items.

A trade agreement similar to the Anglo-U.S.A. pact was also signed last week between Canada and the United States.

Rates of Import Duty on American Chemicals

Details of the chemical and allied products affected by the Anglo-American Agreement are contained in Schedules I and IV and are given below :—

Rates of duty for articles grown, produced or manufactured in the U.S.A. entering the United Kingdom :—

Boron minerals, crude, and concentrates of boracite and rasorite, free; asphalt and bitumen, natural, 10 per cent. *ad val.*; sulphur, free; rosin (colophony), free; paraffin wax, 10 per cent. *ad val.*; boric acid (refined), 20 per cent. *ad val.*; borax (refined), 20 per cent. *ad val.*; sodium chromate, 10 per cent. *ad val.*; sodium bi-chromate, 8s. per cwt.; chestnut extract, 10 per cent. *ad val.*; carbon black from natural gas, 10 per cent. *ad val.*

Oil varnishes containing one or more of each of the following ingredients, viz., resins, drying oils, thinners and driers, but not including cellulose ester varnishes and preparations containing pigments, 15 per cent. *ad val.*; petroleum jelly not containing any other substance, 10 per cent. *ad val.*; soft soap, 15 per cent. *ad val.*; hard soap, other than abrasive soap and toilet soap, 15 per cent. *ad val.*; shaving soap and cream and brushless shaving cream, 15 per cent. *ad val.*; celluloid (cellulose nitrate) film base, not sensitised, and celluloid scrap and waste, 10 per cent. *ad val.*; toilet preparations of the following descriptions (excluding bath salts and essences, prepared fullers earth and soap): tooth paste or powder and liquid preparations for dental purposes and mouth washes, 20 per cent. *ad val.*; toilet paste or powder, 20 per cent. *ad val.*; toilet cream, 20 per cent. *ad val.*; lipstick, rouge and greasepaint, 20 per cent. *ad val.*; hair dyes, 20 per cent. *ad val.*; preparations for use in manicure or chiropody, 20 per cent. *ad val.*; other preparations for use on the hair, face or body, 20 per cent. *ad val.*; printers' ink, 17½ per cent. *ad val.*

The following articles entering the United States from the United Kingdom have been granted concessions in rates of duties. The present rates of duty are given in brackets:

Stearic acid, 15 per cent. *ad val.* (25 p.c.); sodium alginate, 20 per cent. *ad val.* (25 p.c.); ammonium carbonate and bicarbonate, 1 c. per lb. (2 c. per lb.); blackings, powders, liquids, and creams for cleaning or polishing, not specially provided for, and not containing alcohol, 12½ per cent. *ad. val.* (25 p.c.); chalk or whiting or Paris white, precipitated, 15 per cent. *ad val.* (25 p.c.); metacresol, orthocresol, and paracresol, all the foregoing having a purity of 75 per centum or more, but less than 90 per centum, and metaparacresol having a purity of 75 per centum or more, 20 per cent. *ad val.* and 3½ c. per lb. (40 p.c. and 7 c. per lb.); orthocresol having a purity of 90 per centum or more, 10 per cent. *ad val.* and 1¾ c. per lb. (20 p.c. and 3½ c. per lb.); metacresol and paracresol, having a purity of 90 per centum or more, 15 per cent. *ad val.* and 3½ c. per lb. (20 p.c. and 3½ c. per lb.).

Cellulose Esters and Ethers

Cellulose acetate, and compounds, combinations, or mixtures containing cellulose acetate: In blocks, sheets, rods, tubes, powder, flakes, briquets, or other forms, whether or not colloided, and waste wholly or in chief value of cellu- component material of chief value: Finished or partly finished articles, 25 c. per lb. (50 c. per lb.); all compounds of cellulose (except cellulose acetate, but including pyroxylin and other cellulose esters and ethers), and all compounds, combinations, or mixtures of which any such compound is the component material of chief value: Finished or partly finished articles not specially provided for, made in chief value from transparent sheets, bands, or strips not exceeding three one-thousandths of one inch in thickness, 50 per cent. *ad. val.* (60 p.c.); extracts, dyeing and tanning, not containing alcohol: myrobalan, 10 per cent. *ad val.* (15 p.c.); mangrove, 7½ per cent. *ad val.* (15 p.c.).

Flavouring extracts and natural or synthetic fruit flavours, fruit esters, oils, and essences, all the foregoing not containing alcohol, and not specially provided for, 15 per cent. *ad val.* (25 p.c.); magnesium carbonate, precipitated, 1 c. per lb. (1½ c. per lb.); magnesium oxide or calcined magnesia, 5 c. per lb. (7 c. per lb.); sod oil, 3 c. per gal. (5 c. per gal.); sperm oil, refined or otherwise processed, 7 c. per gal. (14 c. per gal.); spermaceti wax, 2½ c. per lb. (3½ c. per lb.).

Enamel paints, consisting of pigments or colours ground in or mixed with varnish, not specially provided for, 15 per cent. *ad val.* (25 p.c.); ultramarine blue, dry, in pulp, or ground in, or mixed, with oil or water, wash and all other blues containing ultramarine, if valued at more than 10 cents per pound , 3 c. per lb. (4 c. per lb.); litharge and red lead, 2¼ c. per lb. (2½ c. and 2¾ c. per lb. respectively); all pigments containing lead, dry or in pulp, or ground in or mixed with oil or water, not specially provided for, and not in chief value of suboxide of lead, 20 per cent. *ad val.* (not less than 15 p.c. nor more than 30 p.c.); umbers, crude or not ground, 1/16 c. per lb. (⅛ c. per lb.); synthetic iron oxide and iron hydroxide pigments, not specially provided for, 15 per cent. *ad val.* (20 p.c.); spirit varnishes, containing 5 per centum or more of methyl alcohol, 15 per cent. *ad val.* (25 p.c.); varnishes, including so-called gold size or japan, not specially provided for, 15 per cent. *ad val.* (25 p.c.).

Toilet soap, 20 per cent. *ad val.* (30 p.c.); leather

soap, including saddle soap, not specially provided for, 10 per cent. *ad val.* (15 p.c.); sodium chloride or salt, in bulk, 4 c. per 100 lb. (11 c. per 100 lb.); china clay or kaolin, $1.75 per ton ($2.50); fuller's earth : unwrought and unmanufactured, $1 per ton ($1.50); wrought or manufactured, $2 per ton ($3.25); fluorspar containing more than 97 per centum of calcium fluoride, $4.20 per ton.

Graphite or plumbago, crude or refined : amorphous, 5 per cent. *ad val.* (10 p.c.); crystalline lump, chip, or dust, 15 per cent. *ad val.* (30 p.c.); ground Cornwall stone, 20 per cent. *ad val.* (30 p.c.); biological, chemical, metallurgical, pharmaceutical, and surgical articles and utensils of all kinds, including all scientific articles, and utensils, whether used for experimental purposes in hospitals, laboratories, schools or universities, colleges, or otherwise, all the foregoing (except articles provided for in paragraph 217 or in sub-paragraph (*e*) of paragraph 218 of the Tariff Act of 1930), finished or unfinished, wholly or in chief value of fused quartz or fused silica, 40 per cent. *ad val.* (50 p.c.); tubes (except gauge glass tubes), rods, canes, and tubing, with ends finished or unfinished, for whatever purpose used, wholly or in chief value of fused quartz or fused silica, 30 per cent. *ad val.* (40 p.c.); gaug glass tubes, wholly or in chief value of glass, 35 per cent. *ad val.* (60 p.c.).

Iron in pigs and iron kentledge, not containing more than four-hundredths of 1 per centum of phosphorus, 75 c. per ton ($1.12½ per ton); pyrometers and moisture testers which are scientific or laboratory instruments, apparatus, utensils, or appliances, and parts thereof, wholly or in chief value of metal, and not plated with gold, silver, or platinum, finished or unfinished, and not specially provided for, 25 per cent. *ad val.* (40 p.c.); aluminium, and alloys (except those provided for in paragraph 302 of the Tariff Act of 1930) in which aluminium is the component material of chief value, in coils, plates, sheets, bars, rods, circles, disks, blanks, strips, rectangles, and squares, 6 c. per lb. (7 c. per lb.); seamless brass tubes and tubing, 4 c. per lb. (8 c. per lb.); bronze tubes, 4 c. per lb. (8 c. per lb.); nickel, and alloys (except those provided for in paragraph 302 or 380 of the Tariff Act of 1930) in which nickel is the component material of chief value : tubes and tubing, 12½ per cent. *ad val.* (25 p.c.); and, in addition, if cold rolled, cold drawn, or cold worked, 5 per cent. *ad val.* (10 p.c.).

Molasses and sugar syrups, not specially provided for, which contain soluble non-sugar solids (excluding any foreign substance that may have been added) equal to more than 6 per centum of the total soluble solids : testing not above 48 per centum total sugars, 1/6 c. per gal. (¼ c. per gal.); testing above 48 per centum total sugars, 11/60 c. additional for each per centum of total sugars and fractions of a per centum in proportion (0.275 c.); salicin, 35 per cent. *ad val.* (50 p.c.).

Tin in bars, blocks or pigs, alloys in chief value of tin not specially provided for, and grain or granulated and scrap tin, including scrap tin plate, free (subject to the provisions of paragraph 1785, Tariff Act of 1930); fuel oil derived from petroleum, gas oil derived from petroleum, and all liquid derivatives of crude petroleum; and lubricating oil; and gasoline or other motor fuel; and paraffin and other petroleum wax products; any of the foregoing sold for use as solid supplies, ships' stores, sea stores, or legitimate equipment on vessels of war in the United States or of any foreign nation, or vessels employed in the fisheries or in the whaling business, or actually engaged in foreign trade or trade between the Atlantic and Pacific ports of the United States or between the United States and any of its possessions, under regulations prescribed with the approval of the Secretary of the Treasury, exempt from taxes imposed in Sec. 601 (*c*) (4) of the Revenue Act of 1932, as amended.

A project for large-scale utilisation of the extensive alunite deposits in Sweden submitted to the government envisages the annual production from 1 million tons alunite of 30 to 40,000 tons potash salts, 100,000 tons alumina and 200 to 500,000 tons ferrous sulphate.

Recent Trade Literature

The ordinary plug cock on chemical services is said to be better than gate or globe valves because in the "open" position no machine faces are exposed to corrosion, erosion, or the deposition of solid matter or scale, and further, a straightway is offered to the pipe line fluid. The simple construction of the smaller number of moving parts are also an advantage over other types of valve. In the Audco Valve, details of which are given in a four page booklet issued by the AUDLEY ENGINEERING CO., LTD., these inherent advantages are said to be happily allied to a scientific method of lubrication.

In a recently issued catalogue HATHERNWARE, LTD., give details of their new improved "Greyware," a high grade stoneware with a dense grey body covered by a brown glaze which they have adopted as their standard material. It is said that it has non-absorbent properties and possesses toughness with great resistance to mechanical and heat shock. In addition, extensive use is being made of Hathernware white stoneware, which is very suitable for handling materials employed in the manufacture of foodstuffs, pharmaceuticals, cosmetics and perfumes, its smooth leadless glaze giving entire freedom from contamination. Stoneware piping and stoneware acid pumps are also dealt with in lists issued by the company.

THE NEPTUNE METER CO., New York, whose agent in this country is F. H. Williams, 81 Gracechurch Street, London, E.C.3, have issued a leaflet describing their product and its value to industry wherever liquids are used. It is emphasised that the broadening of application of these meters to general industrial needs is a relatively new development and is claimed to extend to industry a new standard of accuracy in liquid handling and measurement. The indicating and recording mechanism of the machine has been specially adapted to plant needs. It provides large distance reading dials with calibration in units and totals to suit particular requirements, reset mechanism for individual runs, and separate totaliser readings for permanent record. A separate booklet describing the meters in detail has also been issued by the company.

Spectroscopy thirty years ago was, as far as chemists were concerned, the hobby of a very limited number, and the same applied to spectrophotometry, which term as applied to absorption spectra indicates the determination of the absorption of a substance for each wavelength in the spectrum. Its gradual acceptance as a physical method of value to the organic chemist and the biologist is largely due to the visual and photographic instruments introduced from 1904 onwards by ADAM HILGER, LTD., it is claimed in a sixty-three page publication by the company dealing with outfits for absorption spectrophotometry. Details of the various instruments of the outfits are given. Spectrographic outfits for metallurgical and general chemical analyses are dealt with in another book issued by Adam Hilger, Ltd. It forms a guide to the choice of suitable spectrographic apparatus for technical laboratories, and the wealth of detail includes remarks on the present day position of spectrographic analysis.

Two important points in the operation of refrigeration plant are the removal of solid matter, and of moisture from the liquid refrigerant. Solid matter such as sand or scale, may result in blockage at such points as the expansion valve seat, while the presence of water results in the formation of ice at the point of expansion, either blocking the expansion valve or causing it to stick. The BRITISH THERMOSTAT CO., LTD., have, in this connection, introduced a new range of strainers and dryers known as model DN, details of which are given in a new catalogue No. 347a. A similar sheet has been issued by the company dealing with their standard half-inch and three-quarter-inch Model WV pressure-operated water valves, which are primarily designed for use in refrigerating plants to regulate the flow of cooling water to the condenser, in relation to load on the plant.

Personal Notes

MR. ARTHUR BROCK, governing director of C. T. Brock and Co., fireworks manufacturers, left estate valued £2,814 (net personalty nil).

MR. JOHN GALE GUNSTONE, formerly secretary of Howard and Sons, Ltd., Stratford and Ilford, left £11,648 (net personalty £10,268).

MR. ARTHUR EDWARD BARFIELD, chairman of Wild-Barfield Electric Furnaces, Ltd., Holloway, left £36,758 (net personalty £34,140).

MR. W. H. BLUNDSTONE, B.Sc., A.M.I.GasE., the Newark Borough Gas Engineer, has been admitted an associate member of the Institution of Chemical Engineers.

MR. LESLIE K. OSMOND, head of the firm of Osmond and Sons, Grimsby, manufacturing veterinary chemists, has been elected an alderman by the Grimsby Town Council.

Dr. E. F. Armstrong, F.R.S., who has been appointed a director of the South Suburban Gas Co., in succession to the late Dr. Charles Carpenter.

MR. NORMAN KETTLEWELL BENTLEY, dyer and finisher and managing director of J. E. Bentley and Co., Ltd., Dunkirk Mills, Halifax, left estate valued at £5,778 (net personalty nil).

DR. SAMUEL SMILES, who held the Daniell Chair of Chemistry at King's College from 1920 till his recent retirement, has had the title of Professor Emeritus conferred on him by London University Senate.

COUNCILLOR A. J. GILLIAN, general secretary of the Chemical Workers' Union, and member of the Southwark Borough Council, London, has for the fifth consecutive time been appointed chairman of the Borough's public health committee.

MR. GEORGE FREDERICK BLOOMFIELD, a chemist with the British Xylonite Co., Brantham, Suffolk, was recently married at Ely, to Miss Margaret Millicent Aggas, who is employed in the manager's department of the company.

MR. JAMES K. DICKIE, a member of the Institution of Chemical Engineers and manager of the coke and by-product plant of James Nimmo and Co., Ltd., Auchengeich, has been appointed manager of the new coke and by-product plant at present under construction for Colvilles Ltd., Clyde Iron Works, Glasgow.

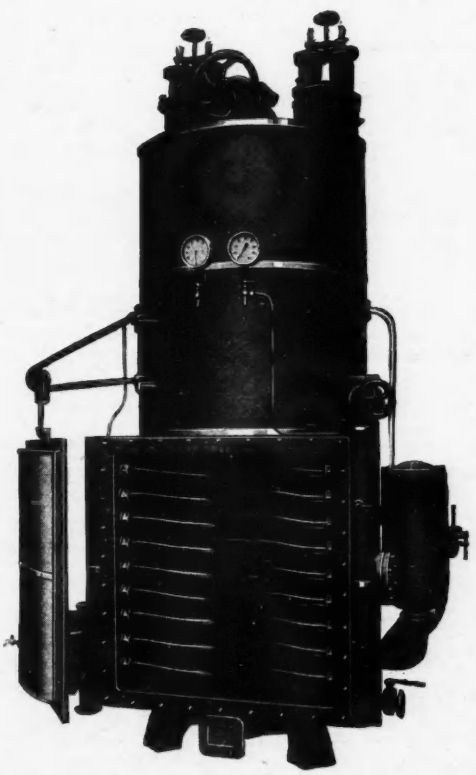
DR. J. F. THOMPSON, of New York, executive vice-president of the International Nickel Co. of Canada, Ltd., presented nearly 300 gold badges to members of the Mond Nickel Co., who have 25 years' or more service, and inaugurated a South Wales branch of the Inco Quarter Century Club of the Mond Nickel and associated companies at Swansea last week.

Utilisation of Surplus Molasses

Promising Outlet as Road-making Material

AS part of the investigations being carried out in India on the economic utilisation of surplus molasses, as for example for the production of industrial alcohol, efforts are being made to develop the use of the material as a road-making constituent. Dr. Sen, bio-chemist, the Imperial Institute of Sugar Technology, has been experimenting with the road-making possibilities of molasses and has come to the conclusion that there is great scope for molasses roads in India, since the main ingredients required, viz., molasses and coal tar, are available in unlimited quantities. The first step according to Dr. Sen, is to instal small tar-making plants in the different provinces, preferably near the sugar factories, so that tar may be supplied to the road contractors without incurring any extravagant transport charges. It is estimated that from the quantity of molasses available, nearly 7,000 miles of good roads can be constructed every year.

The Sen process, as it is known, consists of resinification in the presence of an acid catalyst. In the first place molasses are dehydrated by progressive thickening till the temperature rises to 135° C., and it can be drawn into strings. The resulting substance is then acidified until its solubility is reduced to a minimum. The acidified molasses are then resinified with a mixture of coal tar and asphalt in the presence of acid.



One of the four evaporators supplied by Cairdland Rayner, Ltd., for the s.s. "Queen Elizabeth." These have a combined capacity of 400 tons of distilled water per day from either sea or fresh water feed, when supplied with steam at 75 lbs. per sq. inch. The evaporators are approximately 13 ft. in height by 6 ft. wide, and are mainly of cast iron construction with heating coils of copper and fittings of gunmetal. Fitted in the vapour space is a baffle of the latest type, designed to prevent priming and carry-over. These evaporators are similar to those the company supplied to the s.s. "Queen Mary" and the new "Mauretania."

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From Week to Week

THE FORTIETH ANNIVERSARY of the discovery of radium by Pierre and Marie Curie, was celebrated in Paris on Wednesday.

WHILE WORKING on a disused blast furnace at Dorman Long and Co.'s ironworks, Redcar, on Sunday, four men were overcome by gas—two fatally.

THE BOOT AND FLOOR POLISH TRADE BOARD (GREAT BRITAIN) has been established by regulations made by the Minister of Labour in Statutory Rule and Order No. 1344, 1938.

THE NEW OIL REFINERY FOR MARGARINE PRODUCTION built by Benninga (Hull), Ltd., is expected to be in production at King's Mill, Stoneferry, Hull, in three weeks' time. It will produce 500 tons of oil and fats per week.

THE IMPORT DUTIES ADVISORY COMMITTEE announce that they have decided not to make any recommendations in regard to the application previously advertised for an increase in the import duty on potassium permanganate.

A DECREE pronounced by the President of the Argentine, dated November 7, provides that on and after December 1, importers must in all cases obtain a prior exchange permit before the goods can be cleared through the Customs.

GOOD PROGRESS IS BEING MADE in the preparations for the establishment at Hooe Lake, near Plymouth, of extensive cement works at which it is proposed to turn to commercial account large areas of mud in the estuary of the river Plym.

IN CONSEQUENCE OF THE RECENT £10,000,000 LOAN granted by Britain to Turkey for the development of her industrial resources, five English metallurgical consultants, under the direction of Mr. Michael J. Callow, director of British Geco Engineering Co., have left for Turkey.

THE OLD CASTLE IRON AND TINPLATE CO., the Western Tinplate Co., the Kidwelly Tinplate Co., the Teilo Tinplate Co., and the Ashburnham Tinplate Co., which have a combined capital of about £1,000,000, own 42 mills and normally employ about 2,500 people, propose amalgamating. The object of the merger is to offer resistance to the competition which is regarded as inevitable from Richard Thomas and Co.'s strip mill at Ebbw Vale.

MR. A. PARKER HAGUE, general manager of operations to the Mond Nickel Co., speaking at a company function in the Brangwyn Hall, Swansea, last week, announced that they were embarking on a scheme for a new £250,000 gas plant at the Mond Nickel Refinery, Clydach, South Wales. After the function, Mr. Parker Hague told an inquirer that the scheme could be regarded as another confirmation of the company's faith in the conduct of the refinery and its future. The design of the new gas plant, he added, was well in hand and construction would commence shortly.

DURING THE MONTH OF OCTOBER, the shipments of China Clay, China Stone and Ball Clay were very satisfactory, making a total of 70,597 tons. The previous month of September was the best month of the present year with an aggregate of 76,288 tons and March was third in order of volume with 64,281 tons. In the ten months of the present year the shipments were: 533,738 tons of China Clay, 29,932 tons of China Stone, 17,242 tons Ball Clay, compared with 738,527 tons of China Clay, 38,358 tons of China Stone and 28,266 tons of Ball Clay for the corresponding period in 1937—a drop of 224,239 tons. Through the Anglo-American Agreement China Clay producers are hoping that trade with America will be developed in the near future.

THE FOREIGN TRADE RETURNS for Greater Germany in October show imports at 526,300,000 m. and exports at 490,200,000 m., these totals being respectively 33,700,000 m., and 48,400,000 m. higher than in September. The trade balance for Greater Germany in October shows an import surplus of 36,100,000 m., compared with an import surplus of 50,900,000 m. in September. Apart from the alteration due to the inclusion of the Sudetenland figures, the higher volume of exports is attributable to seasonal tendencies. Germany's imports from Britain in the third quarter of this year amounted to about £5,800,000. Her exports to Great Britain were about £6,900,000, thus leaving a trade balance in Germany's favour of £1,100,000.

SIR RHYS WILLIAMS, a prominent member of British aluminium interests, and chairman of the company negotiating for a 200-acre site to accommodate an aluminium factory and staff on the Rheola Estate, Resolven, Neath Valley, South Wales, states in an interview that provided there is no last-minute hitch, an aluminium factory will be established at Resolven. Mr. Clifford Protheroe, chairman of Neath Rural District Council, who interviewed Sir Rhys, said that he understood that construction would commence within three months. A later message from Montreal confirms his proposal by announcing that Canadian aluminium interests have joined Swiss and British producers in the formation of the South Wales Aluminium Co., Ltd., which will build an aluminium smelter in Glamorganshire. The proposal that the Resolven factory would be erected was exclusively forecast in our columns on July 30, 1938.

THE D'ARCY EXPLORATION CO., LTD., a subsidiary of the Anglo-Iranian Oil Co., Ltd., which abandoned seven of its oil prospecting licences earlier in the year, has announced that it has relinquished a further licence granted to it under the Petroleum Production Act, 1934, for 192 square miles in parts of Hampshire and Surrey.

AN ANALYSIS published in the *Ministry of Labour Gazette* on November 18, shows that at July 4 this year it was estimated that approximately 15,742,850 persons in Great Britain and Northern Ireland, aged 14 to 64, were insured against unemployment. Last year the figure was 15,334,100. A notable increase has occurred in explosives manufacture where the figure has risen by 7,740.

OFFICIALS OF ELDORADO GOLD MINES, LTD., which produces radium in its refinery at Porthope, Ontario, from material mined in the North-West territories, state that they have received from the British Government an order for 11 grams of radium, at a cost of about $1,000,000 (£200,000). The present output of their plant is 500 milligrams every four days, and it is estimated that 11 months will be required to fulfil the order.

AN EXPLOSION OCCURRED on November 16, in the chemical mixing section of the smoke bomb department at the works of the Wessex Aircraft Engineering Co., Salisbury, as a result of which four employees were injured and two suffered from shock. Mr. Geoffrey Lywood, joint managing director, stated that the cause of the explosion is unknown and the mechanical mixing department is sealed pending, it is expected, an official inquiry by the Home Office.

THE CHILEAN NITRATE EDUCATION BUREAU is preparing a new edition of the "Bibliography of References to the Literature on the Minor Elements and Their Relation to the Science of Plant Nutrition." It will include about 4,700 abstracts and references, and will be ready for distribution in January, 1939. The Bureau states that, because of its size, this will probably be the last edition of this work to be undertaken. A nominal charge of $1.00 per copy is made for this volume and advance orders may be sent to the offices of the Chilean Nitrate Educational Bureau, 120 Broadway, New York City.

MR. J. R. ADAMS, H.M. Trade Commissioner at Brisbane, is now in the United Kingdom on an official visit. Mr. Adams will be at the Department of Overseas Trade for the week commencing Monday, December 5, for the purpose of interviewing manufacturers and merchants interested in the export of United Kingdom goods to Australia, after which he will undertake a short tour of certain industrial centres in the provinces. Firms who desire interviews with Mr. Adams in London, or wish to obtain information regarding his arrangements to visit the provinces should apply to the Department of Overseas Trade, 35 Old Queen Street, London, S.W.1, quoting reference 14763/1938.

THE NEED FOR SOLVING THE UNEMPLOYMENT PROBLEMS of the Welsh tinplate industry was urged by a deputation of M.P's. and representatives of local authorities from Swansea and West Wales, who saw the Minister of Labour last week. The deputation mentioned that the local authorities had passed a resolution that the Minister should regard South Wales as an industrial unit for the planning of new and additional industries and that the whole of the districts now excluded be added to the special areas. In reply, the Minister said that the Government did not intend to extend the special areas, but proposed to facilitate loans for new undertakings in certain areas of heavy unemployment outside the special areas.

THE GRAND COUNCIL OF THE FEDERATION OF BRITISH INDUSTRIES, at its last meeting, authorised the president, Mr. Peter Bennett, to set up a committee to consult with the Government regarding the steps which could be taken to further co-operation between industry and the Government for the speedy carrying out of the defence programme, and the fuller development of plans for the mobilisation of industry in the event of war. The President has appointed the following to serve on the committee under his chairmanship: Lord Gainford, Lord Hirst, Sir James Lithgow, Sir George Beharrell, and Mr. Guy Locock. The committee will take part in meetings with Sir J. Anderson (Lord Privy Seal) and Sir T. Inskip (Minister for the Co-ordination of Defence) in the near future.

THE BRITISH TRADE EXPEDITION TO AFRICA, organised by Trade Expeditions (1938), Ltd., leaves this country on the start of its 14,000 mile tour early next year. The expedition will consist of a large fleet of motor vehicles carrying merchandise and samples from leading British manufacturers whose appreciation of the importance of the markets to be covered by the expedition has led them to participate in this co-operative effort. It leaves Harwich for Antwerp, then goes through Europe to Istanbul, Asia Minor, Palestine, Egypt, down by a devious route to Cape Town. At over sixty important towns and commercial centres en route the expedition will halt for periods of from three to ten days for exhibitions of the products carried. The staff are all men with an intimate knowledge of the trade requirements and conditions of the countries through which the expedition will pass.

Weekly Prices of British Chemical Products

THE demand for chemical products during the past week has not been particularly active, and the tone in most sections has been quietly steady. The attention of the chief consumers is now turning towards their requirements for 1939, and the bulk of the regular forward business has yet to be negotiated. Apart from a further weakness in acetone there are no important price changes to record, values being steady throughout. Trade in the coal tar products continues to be on the slow side with quotations well held. Existing conditions are expected to continue until the New Year.

Price Changes

Rises: Pyridine (Manchester); Vermilion.

Falls: Acetone; Cadmium Sulphide; Pitch (Manchester).

MANCHESTER.—Trading in chemicals on the Manchester market during the past week has been on a moderate scale. In the few instances where contract prices for next year's deliveries have been announced there have been a fair number of orders placed, but in most other instances new business has been largely a question of spot parcels. Taking the consuming industries as a whole in this area the call for supplies of the leading heavy chemicals is on a fair scale. The prices position generally is steady, although some further slight easiness has been apparent among the tar products. The demand for solvent naphtha, toluol and pyridine has been fair.

GLASGOW.—Business in general chemicals has been rather quiet since our last report, both for home trade and export. Prices, however, continue quite steady at about previous figures, and a number of prices for contract deliveries over 1939 have now been fixed, mostly at the same prices as for 1938.

General Chemicals

ACETONE.—£38 to £40 per ton.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey, £18 10s. per ton, d/d U.K. Fine white, 98%, £17 per ton, d/d U.K.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £16 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2½d. per lb.; liquor, £13 per ton d/d station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—10d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0½d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in casks. MANCHESTER: £19 15s. per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £3 17s. 6d. to £4 17s. 6d. per cwt. according to quantity; in drums, £3 10s. 0d. to £4 2s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £30; brown, £1 per ton less. MANCHESTER: White, £31; brown, £30.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £31 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £31 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton. SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. SCOTLAND: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 10d. pe. lb.; powder B.P., 6s. 0d.; bichloride B.P. (corros. sub.) 5s. 1d.; powder B.P. 4s. 9d.; chloride B.P. (calomel), 5s. 10d.; red oxide cryst. (red precip.), 6s. 11d.; levig. 6s. 5d.; yellow oxide B.P. 6s. 3d.; persulphate white B.P.C., 6s. 0d.; sulphide black (hyd. sulph. cum sulph. 50%), 5s. 11d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3½d. per lb.

POTASH CAUSTIC.—Solid, £35 5s. to £40 per ton according to quantity, ex store; broken, £42 per ton. MANCHESTER: £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4½d. per lb. MANCHESTER: £37 per ton.

POTASSIUM DICHROMATE.—5½d. per lb. carriage paid. SCOTLAND: 5½d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9½d. to 10½d. per lb. SCOTLAND: B.P. Crystals, 10½d. MANCHESTER: B.P. 9½d. to 11½d.

POTASSIUM PRUSSIATE.—5½d. per lb. SCOTLAND: 6½d. net, in casks, ex store. MANCHESTER: Yellow, 6½d. to 6½d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6½d. per lb. net, ex store

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d. per ton, d/d address in barrels. Dog-tooth crystals, £36 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 11s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

Soda, Caustic.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. **Scotland**: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

Soda Crystals.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

Sodium Acetate.—£19-£20 per ton carriage paid North. **Glasgow**: £18 10s. per ton net ex store.

Sodium Bicarbonate.—Refined spot, £10 15s. per ton d/d station in bags. **Glasgow**: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. **Manchester**: £10 15s.

Sodium Bisulphite Powder.—60/62%, £14 10s. per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

Sodium Chlorate.—£27 10s. to £32 per ton. **Glasgow**: £1 11s. per cwt., minimum 3 cwt. lots.

Sodium Dichromate.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts.

Sodium Chromate.—4½d. per lb. d/d U.K.

4d. per lb. **Glasgow**: 4½d. net, carriage paid.

Sodium Hyposulphite.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. **Manchester**: Commercial, £11; photographic, £15 10s.

Sodium Metasilicate.—£14 5s. per ton, d/d U.K. in cwt. bags.

Sodium Nitrate.—Refined, £8 per ton for 6-ton lots d/d. **Glasgow**: £1 12s. 0d. per cwt. in 1-cwt. kegs, net, ex store.

Sodium Nitrite.—£18 5s. per ton for ton lots.

Sodium Perborate.—10%, 9½d. per lb. d/d in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.

Sodium Prussiate.—½d. per lb. for ton lots. **Glasgow**: 5d. to 5½d. ex store. **Manchester**: 4½d. to 5d.

Sodium Silicate.—£8 2s. 6d. per ton.

Sodium Sulphate (Glauber Salts).—£3 per ton d/d.

Sodium Sulphate (Salt Cake).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. **Scotland**: Ground quality, £3 5s. per ton d/d. **Manchester**: £3 12s. 6d.

Sodium Sulphide.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. **Manchester**: Concentrated solid, 60/62%, £11; commercial, £8 10s.

Sodium Sulphite.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

Sulphur Precip.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

Sulphuric Acid.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

Tartaric Acid.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. **Manchester**: 1s. 1½d. per lb. **Glasgow**: 1s. 1½d. per lb., 5%, ex store.

Zinc Sulphate.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

Antimony Sulphide.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

Arsenic Sulphide.—Yellow, 1s. 5d. to 1s. 7d. per lb.

Barytes.—£6 to £6 10s. per ton, according to quality.

Cadmium Sulphide.—3s. 2d. to 3s. 5d. per lb.

Carbon Black.—3¾d. to 4 1/16d. per lb., ex store.

Carbon Disulphide.—£31 to £33 per ton, according to quantity, drums extra.

Carbon Tetrachloride.—£41 to £46 per ton, according to quantity, drums extra.

Chromium Oxide.—Green, 10½d. to 11½d. per lb.

Diphenylguanidine.—2s. 2d. per lb.

India-rubber Substitutes.—White, 4½d. to 5½d. per lb.; dark 3½d. to 4½d. per lb.

Lamp Black.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

Lead Hyposulphite.—9d. per lb.

Lithopone.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

Sulphur.—£9 to £9 5s. per ton. **Sulphur precip. B.P.**, £55 to £60 per ton. **Sulphur precip. comm.**, £50 to £55 per ton.

Sulphur Chloride.—5d. to 7d. per lb., according to quantity.

Vermilion.—Pale, or deep, 5s. per lb., 1-cwt. lots.

Zinc Sulphide.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

Ammonium Sulphate.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

Calcium Cyanamide.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d.; March, £7 17s. 6d.; April/June, £7 18s. 9d.

Nitro Chalk.—£7 10s. 6d. per ton up to June 30, 1939.

Sodium Nitrate.—£8 per ton for delivery up to June 30, 1939.

Concentrated Complete Fertilisers.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

Ammonium Phosphate Fertilisers.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

Benzol.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9d. **Glasgow**: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d. **Manchester**: Pure, 1s. 8d. per gal.; crude, 1s. per gal.

Carbolic Acid.—Crystals, 7½d. to 8½d. per lb., small quantities would be dearer; Crude, 60's, 1s. 7½d. to 1s. 10½d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.

Creosote.—Home trade, 4d. per gal., f.o.r. makers' works; exports 6d. to 6½d. per gal., according to grade. **Manchester**: 3¾d. to 4¼d. **Glasgow**: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6½d.

Cresylic Acid.—97/99%, 1s. 9d. to 2s.; 99/100%, 2s. 6d. to 3s. 6d. per gal., according to specification; Pale, 99/100%. 2s. 1d. to 2s. 3d.; Dark, 95%, 1s. 7d. to 1s. 8d. per gal. **Glasgow**: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 3s. 9d. to 4s. **Manchester**: Pale, 99/100%, 1s. 10d.

Naphtha.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1d. to 1s. 3d. per gal., naked at works, according to quantity. **Glasgow**: Crude, 6½d. to 7¼d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

Naphthalene.—Crude, whizzed or hot pressed, £4 10s. to £5 10s. per ton; purified crystals, £11 per ton in 2-cwt. bags. **London**: Fire lighter quality, £3 to £4 10s. per ton. **Glasgow**: Fire lighter, crude, £6 to £7 per ton (bags free). **Manchester**: Refined, £12 to £13 per ton f.o.b.

Pitch.—Medium, soft, 31s. per ton, f.o.b. **Manchester**: 30s. f.o.b., East Coast. **Glasgow**: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

Pyridine.—90/140%, 12s. to 13s. per gal.; 90/160%, 9s. 8d. to 11s. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. **Glasgow**: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. **Manchester**: 10s. 6d. to 14s. per gallon.

Toluol.—90%, 1s. 10d. per gal.; pure 2s. 2d. **Glasgow**: 90% 120, 1s. 10d. to 2s. 1d. per gal **Manchester**: Pure 2s. 4d. per gallon, naked.

Xylol.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s. 3½d. **Glasgow**: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

Calcium Acetate.—Brown, £6 15s. to £9 5s. per ton; grey, £8 5s. to £8 10s. **Manchester**: Brown, £8s. 10d.; grey, £9 15s.

Methyl Acetone.—40.50%, £32 to £35 per ton.

Wood Creosote.—Unrefined, 6d. to 8d. per gal., according to boiling range.

Wood Naphtha, Miscible.—2s. 8d. to 3s. per gal.; solvent, 3s. 3d. to 3s. 6d. per gal.

Wood Tar.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

Aniline Oil.—Spot, 8d. per lb., drums extra, d/d buyer's works.

Aniline Salts.—Spot, 8d. per lb. d/d buyer's works, casks free.

Benzidine, HCl.—2s. 7½d. per lb., 100% as base, in casks.

Benzoic Acid, 1914 B.P. (ex toluol).—1s. 11½d. per lb. d/d buyer's works.

m-Cresol 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-Cresol 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-Cresol, 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.

Dichloraniline.—2s. 1½d. to 2s. 5d. per lb.

Dimethylaniline.—Spot, 1s. 7½d. per lb., package extra.

Dinitrobenzene.—7½d. per lb.

Dinitrochlorbenzene, Solid.—£79 5s. per ton.

Dinitrotoluene.—48/50° C., 8½d. per lb.; 66/68° C., 11d.

Diphenylamine.—Spot, 2s. 2d. per lb., d/d buyer's works.

Gamma Acid, Spot, 4s. 4½d. per lb. 100% d/d buyer's works

H Acid.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

Naphthionic Acid.—1s. 10d. per lb.

β-Naphthol.—£97 per ton; flake, £94 8s. per ton.

α-Naphthylamine.—Lumps, 1s. 1d. per lb.

β-Naphthylamine.—Spot, 3s. per lb.; d/d buyer's works.

Neville and Winther's Acid.—Spot, 3s. 3½d. per lb. 100%.

o-Nitraniline.—4s. 3½d. per lb.

m-Nitraniline.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-Nitraniline.—Spot, 1s. 10d. to 2s. 1d. per lb. d/d buyer's works.

Nitrobenzene.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

Nitronaphthalene.—9½d. per lb.; P.G., 1s. 0½d. per lb.

Sodium Naphthionate.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

Sulphanilic Acid.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-Toluidine.—10½d. per lb., in 8/10 cwt. drums, drums extra.

p-Toluidine.—1s. 10½d. per lb., in casks.

m-Xylidine Acetate.—4s. 3d. per lb., 100%.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

METHOD, ETC., OF THE WET-TREATMENT OF FIBROUS MATERIALS, ETC.—I. G. Farbenindustrie. (Germany, Nov. 9, '37.) 32375; (Germany, Nov. 11, '37.) 32376.

MANUFACTURE OF THERMOPLASTIC RUBBER MATERIALS.—Imperial Chemical Industries, Ltd. (United States, Nov. 5, '37.) 32263.

ELECTRODEPOSITION OF TIN.—V. A. Lowinger, G. A. W. Pike, and H. J. T. Ellingham. 32196.

DECOMPOSITION OF NICKEL CARBONYL.—Mond Nickel Co., Ltd., and A. E. Wallis. 32152.

PREPARATION OF 2-NITRONAPHTHALENE-4-8-DISULPHONIC ACID.—Montecatini Soc. Generale per l'Industria Mineraria e Chimica. (Italy, Nov. 8, '37.) 31870.

PRODUCTION OF CONSISTENT LUBRICATING GREASES.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Germany, Nov. 22, '37.) 32260.

PROCESS FOR STABILISING, ETC., CELLULOSE TRIACETATE.—North American Rayon Corporation. (United States, Nov. 22, '37.) 32427.

PROCESS FOR STABILISING CARBOHYDRATE DERIVATIVES.—North American Rayon Corporation. (United States, Nov. 22, '37.) 32428.

RECOVERY OF MAGNESIUM SALTS FROM SEA WATER, ETC.—W. H. Parsons. 32019.

METHODS, ETC., OF OXIDISING LIQUIDS, ETC.—G. H. Hulder-Ruhaak, and H. B. Beer. 32357.

PRODUCTION OF CATALYSTS.—Ruhrchemie, A.-G. (Germany, Nov. 26, '37.) 32444.

MANUFACTURE, ETC., OF CONDENSATION PRODUCTS.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 5, '37.) 31845; (Switzerland, Jan. 4.) 31846; (Switzerland, Feb. 3.) 31847; (Switzerland, Oct. 14.) 31848.

Complete Specifications Open to Public Inspection

MANUFACTURE OF NITRO-DYESTUFFS.—I. G. Farbenindustrie. May 2, 1936. 494,960.

PROCESS FOR THE MANUFACTURE AND PRODUCTION OF VALUABLE HYDROCARBON PRODUCTS, more particularly of lubricating oils and Diesel oils by hydrogenation.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). May 4, 1937. 494,980.

PRODUCTION OF AMMONIA DERIVATIVES.—Rohm and Haas Co. May 28, 1936. 494,766.

AROMATIC POLYETHER CHLORIDES.—Rohm and Haas Co. May 14, 1936. 494,767.

AROMATIC POLYETHER CHLORIDES.—Rohm and Haas Co. Feb. 24, 1937. 494,768.

ARYLOXY POLYALKALENE ETHER SULPHONATES.—Rohm and Haas Co. June 20, 1936. 494,769.

EXCHANGING IONS between a solution and an artificial resin.—I. G. Farbenindustrie. May 9, 1936. 495,032.

MANUFACTURE OF MOULDED ARTIFICIAL FUELS.—G. O. F. Piou de Saint-Gilles, and J. G. Y. Saget. May 4, 1936. 494,770.

CATALYTIC MATERIALS and methods of manufacturing the same. British Thomson-Houston Co., Ltd. May 6, 1936. 495,072.

PRODUCTION OF LIQUID FUELS from gaseous olefines.—Ruhrchemie, A.-G. May 11, 1936. 495,075.

SYNTHETIC RESINOUS MATERIALS.—A. Hill, E. E. Walker, and Imperial Chemical Industries, Ltd. May 5, 1937. 495,043.

PRODUCTION OF 2-KETO-l-GULONIC ACID.—K. Merck, L. Merck, W. Merck, and F. Merck (trading as E. Merck (firm of)). July 18, 1936. 495,050.

MANUFACTURE OF WHITE LEAD.—C. S. Piestrak. May 6, 1937. 495,051.

MANUFACTURE OF POLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) May 6, 1937. 494,772.

PROCESS FOR THE MANUFACTURE OF COMPOUNDS of the cyclopentano-polyhydrophenanthrene series.—W. P. Williams (Schering-Kahlbaum, A.-G.). May 6, 1937. (Convention date not granted.) 494,773.

PRODUCING HYDROLYSED CELLULOSE ESTERS of reduced viscosity and manufacture of yarn and other products therefrom.—Kodak, Ltd. May 7, 1936. 495,056.

STABILISATION OF ORGANIC ESTERS OF CELLULOSE.—Distillers Co., Ltd., and E. Berl. May 7, 1937. 495,062.

PROCESS FOR THE MANUFACTURE OF CHLORINATED HYDROCARBON POLYMERISATES.—A. Carpmael (I. G. Farbenindustrie.) May 7, 1937. 495,085.

WORKING UP THE PRODUCT OF THE HYDROLYSIS OF CELLULOSIC BODIES.—E. Neu. Feb. 1, 1937. 494,984.

PURIFICATION OF ALCOHOLS.—G. W. Johnson (I. G. Farbenindustrie.) Aug. 13, 1937. 494,985.

RECOVERY OF HIGH MOLECULAR WEIGHT CARBOXYLIC ACIDS or their salts.—G. W. Johnson (I. G. Farbenindustrie.) July 19, 1937. 494,853.

MANUFACTURE OF CARBAZOLE-ALKYL KETONES.—Armour and Co. Sept. 19, 1936. 494,858.

DETERGENTS and like substances.—Standard Oil Development Co. Nov. 7, 1936. 494,859.

UNITING MATERIALS comprising cellulose or hydrophilic derivatives thereof, together or with other substances.—Dr. A. Wacker Ges Fur Elektrochemische Industrie. Oct. 28, 1936. 494,929.

PRODUCTION OF WHITE CLOUDED ENAMELS ON IRON.—I. Kreidl. Nov. 11, 1936. 494,799.

ANTHRAQUINONE DYESTUFFS and a process for their manufacture.—Chemical Works formerly Sandoz. Dec. 30, 1936. (Sample furnished.) 494,802.

MANUFACTURE OF SALTS OF SULPHURIC ESTERS.—Procter and Gamble Co., and A. O. Snoddy. Jan. 12, 1938. 494,870.

MANUFACTURE AND PRODUCTION OF SUBSTANCES having tanning action.—I. G. Farbenindustrie. Jan. 27, 1937. 494,871.

PREPARING VISCOUS OILS, such as lubricating oils, transformer oils, and the like.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. March 12, 1937. 495,004.

PRODUCTION OF WHITE CEMENT.—O. Schwachheim. May 19, 1938. 494,891.

RENDERING TEXTILES WATER-REPELLENT.—N. E. Brookes (Farberei, A.-G. vorm. E. Stolte Nachfolger and W. Missy.) March 31, 1937. 494,833.

Chemical and Allied Stocks and Shares

SENTIMENT in the industrial and other sections of the Stock Exchange has been dominated by a tendency to await the outcome of recent developments in international affairs. The current market view is that activity in industrial and allied securities is not likely to develop until the European political position is less uncertain, despite the good impression created by the terms of the Anglo-American trade agreement.

Although shares of companies associated with the chemical and kindred trades have not held best prices touched during the past few days they are little changed, when compared with those ruling a week ago. Imperial Chemical, for instance, are 31s. 7½d. at the time of writing and are unchanged on balance, while British Aluminium have gained a few pence to 54s. 9d., and Murex have improved to 80s. Associated Portland Cement have been lowered moderately to 81s. 9d., but British Plaster Board are little changed at 28s. 3d., awaiting declaration of the interim dividend. Borax Consolidated were active around 28s. 3d.

Lever and Unilever fluctuated moderately, but Swedish Match were fairly steady on the assumption that dividends may be resumed next year. Tube Investments were again steady, awaiting the full results. Stewarts and Lloyds were firm on the bonus announced by the company's South African concern. Allowing for the deduction of the dividend, Dorman Long were quite well maintained in price, having remained under the influence of the good impression created by the past year's figures. Stanton Iron and Staveley Iron shares were steady. Babcock and Wilcox were again 37s. 6d.

Pinchin Johnson were slightly lower at 26s., but International Paint, Indestructible Paint and Lewis Berger are little changed at the time of writing. Wall Paper deferred were also quite well maintained, if, as in the case of Lewis Berger, allowance is made for the fact that the price is now "ex" the recently-declared dividend. Michael Nairn held last week's improvement to 60s.

Fison Packard and Prentice ordinary shares remained active and continued to transfer around 39s. British Oil and Cake Mills preferred ordinary were 43s. 9d. Triplex Glass fluctuated moderately, but at 34s., are the same as a week ago. Boots Pure Drug have made the rather higher price of 40s., and Timothy Whites and Taylors at 23s. 9d. were the same as a week ago. Sangers were maintained at 21s. 9d.

More attention has been given to numerous textile shares as a result of the terms of the Anglo-American trade agreement. Bleachers, Bradford Dyers and Calico Printers were among those which made rather higher prices. The preference shares of these companies were also slightly better. Courtaulds fluctuated closely with the day-to-day trend of markets. British Celanese ordinary and preference shares subsequently showed an easier tendency, awaiting publication of the results for the past financial year.

Imperial Smelting were lower at 12s. 6d., pending the decision in regard to the application for an increased duty on foreign zinc. United Molasses have been active at higher prices, awaiting the results, publication of which is imminent. Oil shares were dull and in most cases moved against holders.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BASSETT AND ROBERTS, LTD., London, E.C., oil refiners and distributors. (M., 26/11/38.) Nov. 11, £250 debentures; general charge. * £500. October 28, 1938.

ELTON COP DYEING CO., LTD., Bury. (M., 26/11/38.) Nov. 14, £1,000 debentures, part of a series already registered. * £1,450. December 29, 1937.

W. J. CRAVEN AND CO., LTD., Evesham, manufacturing chemists. (M., 26/11/38.) Nov. 11, debentures, to Lloyds Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. *Nil. March 24, 1937.

Satisfaction

BASSETT AND ROBERTS, LTD., London, E.C., oil refiners and distributors. (M.S., 26/11/38.) Satisfaction November 11, of debentures registered January 28, 1938, to the extent of £250.

Winding-up Petition

BUSSEY COAL DISTILLATION CO., LTD. (W.U.P., 26/11/38.) Nov. 14, by Bussey International, Ltd., 21 Moorgate, E.C. Hearing, Royal Courts of Justice, Strand, Nov. 28.

Receiver Appointed

JOHN BRIERLEY, LTD., Manchester, bleachers and dyers. (R., 26/11/38.) J. C. Burgess, 7 Norfolk Street, Manchester, has been appointed receiver and manager. Nov. 8.

Company News

Cellon, Ltd., have declared an interim dividend of 7½ per cent. (the same).

Titanine, Ltd., are maintaining their interim dividend for 1938-39 at 10 per cent., less tax.

Manbre and Garton, Ltd., have declared a dividend on the ordinary shares of 11 per cent., making 15 per cent.

Chloride Electrical Storage Co. have declared an interim dividend of 5 per cent. on "A" and "B" ordinary shares (the same).

British Tar Products, Ltd., have declared a final dividend of 3¾ per cent., less tax, on ordinary and preferred ordinary, making 10 per cent. (15 per cent., including 5 per cent. bonus).

Wiggins, Teape (1919), Ltd., have declared an ordinary dividend of 10 per cent., tax free, for the year and an extra 1 per cent. on preference shares (the same).

Monckton Coke and Chemical Company, Ltd., have increased their nominal capital by the addition of £70,000 beyond the registered capital of £100,000. The additional capital is divided into 70,000 5½ per cent. cumulative redeemable preference shares of £1.

Burt, Boulton and Haywood, Ltd.—Holders of 6 per cent. 1st mortgage debenture stock have sanctioned the issue of £150,000 4 per cent. 1st mortgage stock. Proceeds are required to repay outstanding 6 per cent. stock and provide funds for further development.

North British Rayon, Ltd., for the year ended June 30, show a net loss of £13,486 (compared with a loss of £10,123 for 1936-37). After crediting £5,611 brought in from the previous year, providing for the preference dividend paid on January 1, 1938, and appropriating the contingencies reserve of £10,000 a credit balance of £437 remains to be carried forward.

Associated Dyers and Cleaners, Ltd.—Following the offer made by Johnson Brothers (Dyers), Ltd., to acquire for cash the whole of the issued capital of Associated Dyers and Cleaners, Ltd. (see THE CHEMICAL AGE, Nov. 19, p. 402), Mr. Cyril Eastman, formerly managing director of the latter company, has addressed a letter to a number of the deferred shareholders advising them against acceptance of the offer. The substance of his argument is that a few years ago the market value of Associated Dyers and Cleaners, Ltd.'s capital was almost five times the cash price now offered, and that during the five years 1922-26 the profits averaged some £79,500 per annum.

Books Received

Justus von Liebig. By Richard Blunck. Berlin: Wilhelm Limpert-Verlag. Pp. 320. RM 7.80.

Forthcoming Events

London.

November 28.—University of London. 5.30 p.m. Professor Jacques Errera, "Intermolecular Forces and Infra-red Spectroscopy." Royal Society of Arts, John Street, Adelphi, W.C.2. 8 p.m. Cantor Lecture. J. H. Partridge, "Refractory Materials."

November 29.—University of London. 5 p.m. Dr. L. Margaret Kerby, "Muscle Chemistry."

November 30.—Society for the Study of Alchemy and Early Chemistry. J. C. Gregory, "From Magic to Science."

December 1.—Chemical Society. Burlington House, Piccadilly, W.1. 8 p.m. Dr. G. S. Hartley, "Aggregation of Ions in Paraffin-chain Salt Solutions."

Society of Chemical Industry. London Section. Annual Dinner. Old Bell Restaurant, High Holborn. 7 p.m.

December 2.—The Royal Institution. 21 Albemarle Street, W.1. 9 p.m. Viscount Samuel, "The Scientist and the Philosopher."

Institute of Fuel. Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. 10.30 a.m. Symposium on Gas Temperature Measurement.

Birmingham.

December 1.—Institute of Metals. James Watt Memorial Institute, Great Charles Street. 7 p.m. H. Sutton, "Light Alloys for Aircraft."

Bristol.

December 1.—Chemical Engineering Group. Joint meeting with the Bristol Section. The University, Woodland Road. 6.30 p.m. G. S. Heaven, "Some Aspects of the Viscose Industry."

Cardiff.

November 28.—Institute of Chemistry. Joint meeting with the Chemical Society. University College, Cathays Park. 7 p.m. Professor W. Wardlaw, "Some Topics in Inorganic Chemistry."

Edinburgh.

November 28.—Institute of Chemistry and Society of Chemical Industry. North British Station Hotel, Princes Street. 7.30 p.m. A. R. Jamieson, "Chemistry in the Service of the Community."

Glasgow.

December 2.—Society of Chemical Industry and the Chemical Society (Glasgow Section). Ramsay Chemical Dinner. Central Station Hotel. 7 p.m.

Hull.

November 29.—Hull Chemical and Engineering Society. Municipal Technical College, Park Street 7.45 p.m. Dr. R. Gordon Booth, "The Chemistry of Vitamins."

Liverpool.

December 1.—Institute of Chemistry. Social evening.

Manchester.

December 2.—Society of Chemical Industry. Constitutional Club, St. Ann Street. L. Urwick, "Planning Permanent Profits—Applying Scientific Management to Scientific Products."

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

British West Indies.—A well-established agent at Kingston, Jamaica, wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of soap (cheap toilet, carbolic and laundry) for Jamaica. (Ref. No. 364.)

British West Indies.—A well-established firm of agents at Port of Spain wishes to obtain the representation, on a commission or purchasing basis, of United Kingdom manufacturers of soap (mottled, pale and brown) in bars; candles and dips; safety matches for Trinidad. (Ref. No. 365.)

Denmark.—Agent, well established in Copenhagen, with excellent connections, desires to obtain for Denmark representation, on a commission basis, of producers of chemical products and essential oils. Extensive experience, highest references. Apply, Box No. S. 313, "Board of Trade Journal," H.M. Stationery Office, Princes Street, Westminster, London, S.W.1.

New Companies Registered

Carboleen Chemicals, Ltd. 9,706.—Private company. Capital £100 in 100 shares of £1 each. To carry on the business of dealers in and brokers, manufacturers, refiners and bleachers of oils, tallows, greases, lard and its compounds, soap, etc. Subscribers: Mrs. Elizabeth M. McParland, 4 Riversdale, Bushy Park Road, Terenure, Dublin; Thomas A. Quinn.

Franks Laboratories, Ltd. 345,837.—Private company. Capital £2,000 in 2,000 shares of £1 each. To establish a laboratory for chemical, physical, electrical, scientific or other research, to make examinations of any substance, process or invention, etc. Subscribers: James W. Wishart, 2 Weech Road, Hampstead, N.W.6; George W. A. Gray.